

Don't let Devon go to waste

at school



Composting in School

A practical guide to composting food waste



Composting in School – a practical guide

This guide is designed to help all the schools in Devon that would like to run, or are already running an initiative connected with composting and food growing. If you are involved with your local school and they are not yet composting perhaps you could take this guide to a staff member you know and suggest they have a look at it.

Other food waste composters are available – however this guide has been written based on the equipment that has been tried and tested successfully at Devon Schools.



The Compost School Special was written by Nicky Scott, Heidi Diepold, Helen Peake and Melissa Harvey in 2012. Illustrations by Bob Gale and Nicky Scott. It was rewritten as the 'Composting in School – a practical guide' in 2016 by Melissa Harvey and Heidi Diepold.

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Introduction – exciting times!

Devon is in the top four county councils for the highest rate recycling and composting in England and Wales and it has pioneered different methods of schools' food waste composting since 2001.



Here there is a wealth of support for teachers who want to reduce their rubbish, recycle as much as they can and compost their food waste; both practically and through the curriculum. Schools can have waste audits and workshops from a team of Waste Educators and technical and practical advice from Devon Community Composting Network - see contacts in Devon on page 46.

School gardens used to be an integral part of school life but then sadly they were seen as less relevant to the modern curriculum and many were abandoned. Now they are coming back as part of a much-needed and more joined up agenda

Devon Teachers can apply for the 'Cutting your wasteline' School Grant, which can be used to purchase composting and recycling equipment

This is funded by Devon County Council in partnership with the District, Borough and Torbay Councils.
For further information see website:
zone.recycledevon.org/funding

involving growing food, procuring locally grown food and teaching children about where their food comes from and how it reaches their plate. Indeed, cooking healthy meals is now a curriculum requirement. Schools are also investigating reducing energy consumption, and reducing their waste overall and composting is a natural part of this commitment.

The government's fruit scheme, which enables KS1 children to eat fresh fruit every day, has meant that many schools now have fruit peelings and cores to dispose of, or compost. Traditionally this fruit waste has been put into a plastic Dalek composter. See the resources section on page 45 for videos to help you successfully use a Dalek composter. These are fine for the amount of food waste produced by a household, but they are rarely up to the task of composting large amounts of school waste efficiently. Some schools have a dalek to show how composting can be done at home, however, experiences of using these in schools have shown that they are quickly filled up and then overwhelmed with dense, oozing, sticky fruit waste, which attracts fruit flies. Children and adults are left with negative experiences of the composting process, and opportunities for using composting as a teaching resource are missed.



However, the good news is that by using the RIGHT composting system fruit waste can be composted efficiently. Indeed all the school's food waste, both raw and cooked, can easily be converted into compost for the school gardens using specialist equipment. Pupils can be actively involved, learning about scientific processes as they take practical action to reduce their school's waste.

If you are a parent, governor or teacher who wants to start composting, or improve your current system, then this guide will help you.



Top tips to reduce food waste

Before you start to compost, you should consider how to reduce your food waste. Here are some top tips. There are further resources on our website:

zone.recycledevon.org/teachers



Improve pupils' familiarity and appreciation of different meals and foods

This will encourage them to try unfamiliar foods rather than leave them on the plate. Some suggestions for how to do this include:

- doing taster sessions with pupils, teachers, catering staff and parents
- gathering feedback from pupils on what they do and don't like
- share school meal recipes with parents so they can try cooking the meals at home
- cook recipes of meals served at lunch at school
- visit the school kitchen with pupils and talk to catering staff
- invite school cooks into classrooms to talk about the food they have sourced and are preparing, the importance of provenance and the joy of eating good food

Improve the dining experience for pupils and staff

Start a School Food Group/School Nutrition Action Group. This is a great way of encouraging the whole school community; parents, teachers, pupils, catering staff to look at issues around food and the dining experience together. Issues to address can include:

- the waiting time in the queue
- ways to encourage staff to eat with pupils
- best use of small space
- changing from canteen trays to plates
- reducing noise in the dining room, or playing calming music
- making the space feel inviting and relaxed

Cook meals to order

Implement a simple system to cook meals to order for pupils. This saves food waste as well as saving money. In order to implement this, the school will need in place a:

- system for pupils/parents to pre-pay for school meals
- way of recording which pupils are having a meal each day
- way to communicate the number of meals ordered to the kitchen each day



Why compost at school?

Food waste is a major component of a typical school's bins, and in most cases this valuable resource is sent to an Energy from Waste plant or landfill site. This booklet will tell you how to compost in a school setting written with the benefit of many years of experience of composting in Devon schools.



Save money - create a valuable resource - compost!

Making your own compost will save your school money as you won't need to buy it in.



Save money - stop paying to have food waste taken away for disposal

Schools pay a significant amount of money to dispose of their (so called) "waste" and much of this could be reused, recycled or composted. Reducing the amount sent for disposal will save your school money by cutting the number of bins you need, or reducing the frequency of their collection. For example, by composting all its food waste, as well as working hard to reduce waste throughout the school, Bradley Barton Primary School, with 266 pupils, have reduced their waste so much they have stopped using two of their rubbish bins - one 1100 litre wheelie bin, costing £270 a year to empty and one 660 litre bin which cost £230 a year - making a yearly saving of £500.

Reduce your school's environmental impact

Composting food waste cuts down on the amount of waste that vehicles collect to take away, thus reducing vehicle exhaust emissions (air pollution). Instead, food waste should be treated as a resource that can be made into compost your school could use.

Bring the curriculum to life - use your school grounds as a learning resource

Teachers know that many children's behaviour improves the moment they go outdoors. They may become very excited if this is a rare occurrence, but once it is normalised children will often behave much better than inside a classroom. Some of us learn better outside and school gardens are a fantastic, often underused resource, for learning.

We have written 'The Compost Curriculum' a handbook to enable teachers to use the composting process as a teaching resource throughout the school year. For each month it contains a curriculum-linked KS2 lesson plan and an Eco Team activity, plus a wealth of supporting documents to bring composting to life for adults and pupils. It can be downloaded from

zone.recycledevon.org/composting

There are videos aimed at KS1 and KS2 on this website, as well as an interactive online compost game.



Why compost at school?



Give pupils a sense of ownership and responsibility

With appropriate adult supervision, pupils can take on much of the day to day responsibility for composting tasks - collecting caddies of food waste, feeding the composter and of course using the compost to grow more fruit and vegetables. Many schools set up teams of pupils to lead their composting work, often with a mix of ages so that older pupils can pass on their expertise to their younger composting colleagues.

The practical tasks involved in composting are enjoyed by all children, whether or not they are high achievers in the classroom.

Support your school's healthy eating and Ofsted review

Under the Ofsted inspection framework, which came into force in September 2015, inspectors will look for a culture of healthy eating throughout their visit, and will consider the atmosphere in the dining space and the effect this has on pupils behaviour. By seeing fruit and vegetable waste recycled into compost and used to grow more healthy food, the culture and understanding of food, and where it comes from, will be enhanced in the school.



Before you start

Choosing which sort of composting to do

You will probably have both raw food, such as fruit and vegetable peelings, and cooked food, such as plate scrapings. There are differences in the composting process between composting raw food and a mixture of raw and cooked food, which are summarised in the table below.

Differences between composting raw food and a mixture of raw and cooked food

| Raw food only | Raw and cooked food |
|--|---|
| <p>Equipment needed</p> <ul style="list-style-type: none"> Raw food can be composted in a static system such as a Hotbox, New Zealand box or pallet bin (see more detail of these systems on pages 10 to 14. However, it will compost faster in a turning system then allowed to mature in a static system. | <ul style="list-style-type: none"> Must be composted through a turning system, such as a Jora or a Ridan, and then followed by a maturation period in a static system such as a Hotbox, New Zealand box or pallet bin. |
| <p>Pros.</p> <ul style="list-style-type: none"> Sometimes starting by composting raw food waste only, can lead to a focus on reducing overall food waste amounts, including cooked food waste. The cost of this equipment can be applied for through the 'Cutting your Wasteline' schools grant see zone.recycledevon.org/funding. | <ul style="list-style-type: none"> A system which composts all food waste, has the potential to save money on bin collection costs, and avoids food going to an Energy from Waste plant/Landfill Site. |
| <p>Cons.</p> <ul style="list-style-type: none"> There is likely to be some cooked food waste which will need to be dealt with. Ideally this will be collected to be composted centrally, or by sending it to an Energy from Waste plant/Landfill Site. | <ul style="list-style-type: none"> The equipment needed to do the composting is more expensive and is not covered by the 'Cutting your Wasteline' school grant. There are more potential complications with composting cooked food waste if instructions are not followed carefully. It is not recommended that cooked food alone is composted as the micro-organisms needed to break down the food waste can be killed in the cooking process. |



Before you start

Legislation

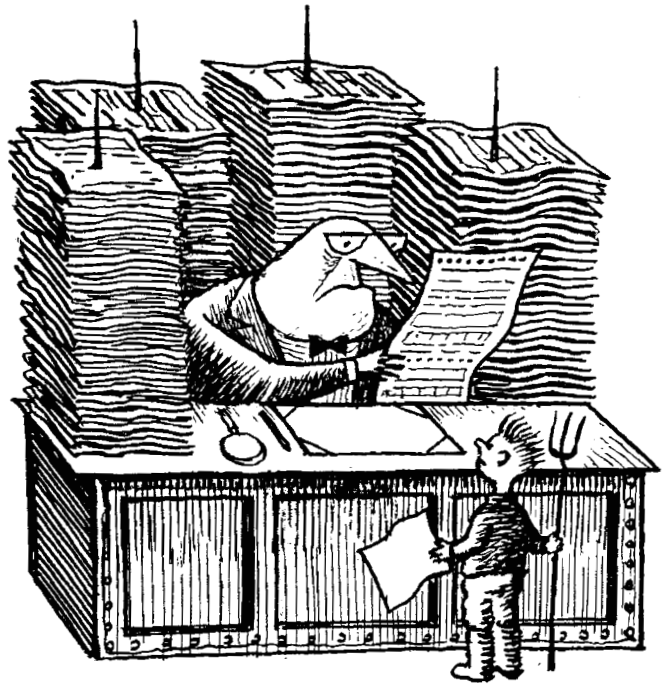
Composting cooked food waste and vegetable peelings from the kitchen.

In order to comply with Animal By Products legislation, any cooked food waste and peelings from the kitchen which is composted at your school, must come from the school site. It must be 'composted' within the school site and the finished product must be 'used' within your school grounds. Only by composting this waste 'in situ' are you exempt from the legislation. To clarify, food can be brought to eat at the school (e.g. packed lunches) and any leftovers can be composted, however 'food waste' cannot be brought in from home to be composted at the school. The resulting compost cannot be sold/given to anyone to use off site.

Therefore, a school considering composting cooked food waste and vegetable peelings from the kitchen, must ensure there are adequate grounds or an on-site garden in which to use the compost.

Composting fruit

Fruit waste which does not come from the kitchen is not affected by the Animal By Products legislation.



Staff time

Cooked food composting is straight forward and does not involve any specialised skills. However, composting tasks need to be carried out daily, so your school will need to give time to a designated adult compost operator for this. In a small school, if some tasks are delegated to pupils (e.g., collecting up caddies from around the school) the compost operator will need about 10-15 minutes per day. Giving the pupils responsibility is great, but they will need to be adequately supervised then using the composter itself. In larger schools, the compost operator will need up to 25 minutes daily. Schools in Devon are composting successfully with compost operators who are teachers, teaching assistants,

caretakers, school cooks and even a few Head Teachers! Ideally the composting responsibilities should be incorporated into the compost operator's job description and plans should be made for an alternative person to carry out composting tasks when they are not at school. If your compost operator leaves, it is important to consider who else will take on the composting tasks. It is essential to ensure that everybody using the equipment has had proper training, including new adults/children who are taking over the responsibility or helping out. Contact one of our compost experts (see Contacts in Devon section on page 46) who can visit the school, free of charge, to help you with this.



Before you start

Waste audit

When looking at waste in schools it is useful to do a waste audit. Here pupils and adults sort through the previous day's school waste and separate it out into its different categories; all the paper in one pile, the card in another etc. These piles are then weighed and the data recorded; perfect for data handling aspects of numeracy and ICT. Devon schools can book a waste audit with experienced Waste Educators (see resources section on page 46).

For the purpose of composting, we strongly advise that you complete a 5 day food waste audit – see page 44 for template form. An Excel version of this can be found on zone.recycledevon.org/compost which will automatically create tables and graphs for you to use with the children.

Using the information from the 5 day weighing sheet you can decide which composting system would be most appropriate for your school's needs.

Remember to include:

- fruit from the fruit scheme and children's snacks
- unserved canteen food
- vegetable peelings etc. from the kitchens
- plate scrapings
- packed lunch food waste – if your school has not adopted a take-home policy for this

The 5 day food waste audit will give you a more accurate figure that incorporates fluctuations from day to day that are not captured using a one-off waste audit (e.g., due to menu variations, changes in the number of pupils having school meals). Auditing the food waste is important as you don't want to spend excessive money on a composter that is too large. Conversely, you wouldn't want equipment that is struggling with more food waste than was expected.

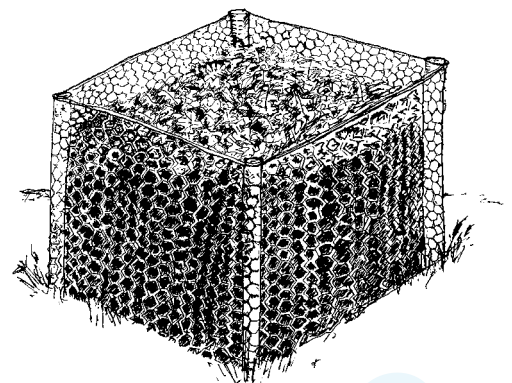
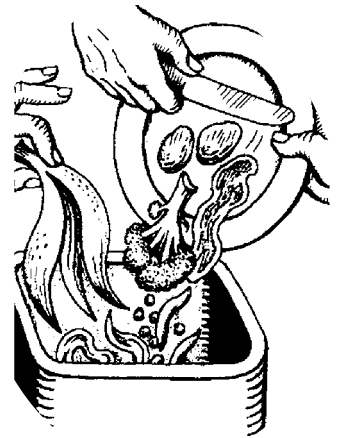
When your pupils see the amount of waste the school produces, it can spark off a desire to implement waste reduction schemes within the school.

With guidance they can think about ways to 'reduce' the amount of waste the school is producing; how it can

be 'reused' and finally set up or improve the existing 'recycling' collections (see your local council in contacts section).

Go to zone.recycledevon.org/3Rs-practical-information for ideas on how to reduce, reuse and recycle your school's waste. The good news is that, with the appropriate equipment, your food waste can be converted into useful compost.

Your school gardens and grounds will also produce compostable material, such as plants and grass cuttings. However, if you are setting up composting for cooked food waste you should continue to use separate compost bins and leaf-mould containers (depending on the size of school and grounds). Cooked food waste composting equipment is expensive and it would be a shame to fill it up with leaves, grass and hedge cuttings and then not have space for the food.



Different composting systems

Once you have decided whether to compost all your food waste (cooked and raw) or just raw food waste, you can choose the equipment that is best for your situation.



Composting raw food waste

You will need a bay or composting box to contain the materials. Experience has shown that specifically designed HotBoxes work well, but there are other options such as a Pallet bin (made from pallets) or a New Zealand box (made from separate planks).

Static systems: HotBox, Pallet bin or New Zealand box



| | HotBox | Pallet bin or New Zealand box |
|---------------------------|---|--|
| Cost and materials | More expensive – made from recycled plastic. | Can be made cheaply from reclaimed wood, demonstrating re-use of materials. |
| Pupil involvement | Pupils can help to put them together. | Pupils can be involved in design and build. |
| Durability | More durable – will last for years if well placed and looked after. | Will usually start to rot and need replacing after 2 – 3 years. |
| Insulation | The design maintains heat from the composting process so produces compost more quickly. | Less insulated so doesn't hold heat from composting, although they can be made larger so the mass of material helps to insulate. |
| Rodents | Rodent unfriendly if well placed on a solid surface. | Easy for rodents to access. |



Different composting systems



How to use a HotBox

| | |
|--|---|
| Description | <ul style="list-style-type: none"> • Insulated bin made from recycled plastic |
| Size | <ul style="list-style-type: none"> • 1000 litres |
| Dimensions | <ul style="list-style-type: none"> • 1m x 1m x 1m |
| Delivery format | <ul style="list-style-type: none"> • Pre-assembled or flat packed |
| Where it is made | <ul style="list-style-type: none"> • Designed and manufactured in Devon |
| Number of chambers | <ul style="list-style-type: none"> • 1 |
| Locating the equipment | <ul style="list-style-type: none"> • To maintain the equipment and reduce the likelihood of rats getting in, place the HotBox on a solid, flat surface |
| How they work as a raw food waste only composting system | <ul style="list-style-type: none"> • Add raw food waste daily and rake level • Whenever food waste is added, add the same volume of carbon source, then rake level • When the HotBox is full, leave it to compost for 6 to 12 months • When it is ready to empty, the front planks slide up for easy access to the compost • Refer to troubleshooting guide if any issues arise, see page 41 |
| How they work as a maturation stage for raw and cooked food waste composting | <ul style="list-style-type: none"> • Add material from the initial stage daily • Rake flat once material has been added • When HotBox is full, leave to mature for 6 to 9 months • When it is ready to empty, the front planks slide up for easy access to the compost • Refer to troubleshooting guide if any issues arise, see page 41 • No additional wood source needed |
| Additional information | <ul style="list-style-type: none"> • The HotBox has a fitted base and lid • Monitor moisture levels regularly • A full HotBox holds approx 625kg compost or 1000 litres |
| Website | <p>www.dccn.org.uk</p> |



Different composting systems



Wooden bin/boxes: New Zealand boxes and Pallet bins

Uses

These can compost raw food and garden waste; they are not appropriate to use for cooked food. They can also be used to give compost time to mature compost once it has been through a turning system.

Size and design - They are generally large, each being around a cubic metre and often bigger; sometimes as single compartments but are more often constructed in series of two or more. This means when the first chamber is full, waste can be added to the next section and so on allowing time for the waste in the first chamber to mature.

They are usually made of wood and can be a solid square in design, have a wooden 'door' or have a front made of planks, which slide up and off to access the compost when needed.

Lids can be made from cardboard sheeting or non-rubber backed carpet, or duvet type covers can be bought to help keep them warm. Due to their size, they can house a large volume of compostable material; this maintains the heat and helps the composting process.

Cons

The downsides are that they are open to rodents and as they are made of wood, they will eventually rot. If the sides are open slatted, the outsides of the compost tends to dry out too much.

Pros

However, they can be made at low or no cost, especially if you reuse planks of wood or pallets. Otherwise slatted sided bins can be purchased from £80 upwards for a single chamber to over £200 for a triple bin. They are easily accessible so alternate layers of 'greens and browns' can be added without difficulty. They can be fun to make and offer children a fabulous opportunity to design and build their own composters.



Different composting systems

How to make your own wooden bin/boxes

Remember to use untreated wood to avoid contaminating your compost

Slatted bin

If it has slats that lift up at the front it is known as a New Zealand box.

The website links below give instructions on how to build a New Zealand box:

http://zone.recycledevon.org/sites/default/files/Build_a_compost_boxEastSussexCC.pdf

http://zone.recycledevon.org/sites/default/files/Make_a_New_Zealand_compost_box.pdf



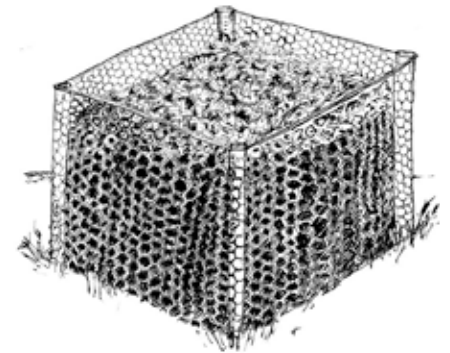
Pallet bin

These are really easy to make; tie four similar sized pallets together with baler twine/string to make a chamber. Hammer in stakes around the base so the composter keeps its shape – see image. Remember to make ‘hinges’ down one side on the front pallet to create a door for easy access. More pallets can be added for further sections.



All kinds of things can be used to build a composter:

Stout wire mesh, such as chicken netting, can be made into a cylinder or square supported with posts. These are ideal for making leaf mould.



Old doors, concrete blocks, corrugated iron sheeting and all manner of discarded panels can be used to make simple containers. The simplest compost heap of all is just a pile on the ground covered with a tarpaulin or non-rubber backed carpet.

Text adapted from 'How to Make and Use Compost: The Ultimate Guide' by Nicky Scott published by Green Books



Different composting systems

Static systems: How to use a HotBox, Pallet bin or New Zealand box



When using a bin/box to compost, there is very little that you need to do other than regularly checking the moisture levels. Squeeze a handful of the compost; if moisture levels are correct, then it should yield a few drops of water; you may well want to wear gloves to do this.

Another method to check moisture levels is to stand back and observe when you take the lid off the HotBox. Watch out for any rising mould spores which are a sign that it is too dry. If this happens, wear a face mask, or be careful not to breathe in the spores; soak the contents in water and leave undisturbed for several days. Mixing in freshly cut grass is another easy way to increase moisture levels, as well as boosting the composting process.

When emptying a bin/box, scoop off the top layers of compost and put this and any worms you find to one side, or into another bin/box if you have more than one. The finished compost in the bottom section can be used immediately on the gardens or bagged up until needed. It is advised that you only apply this compost to the surface of the soil. If you dig it into the soil, micro-organisms will use the nitrogen to break down any remaining woody material, which is the slowest to break down, instead of it being used by the plants to help them grow. See 'Using your compost' section on pages 26 to 27.

If you have two or more bin/boxes, when the first is full, start filling the second and so on. When all of them are full, if enough time has passed and the moisture is sufficient, the first to be filled should be ready to be emptied.

HotBoxes are designed to deal with food waste but they work very well with garden waste too. However, you will quickly run out of space for your food waste if you fill it up with garden waste. Therefore, we recommend that you have a separate composting system in which to compost garden waste.

How many bin/boxes will I need?

Obviously larger schools with larger amounts of waste being composted will need a higher capacity. It makes sense to have at least two bin/boxes, that way when you have filled one you can leave it to continue to compost whilst filling another.



"We are completely filling one HotBox each term. This term we have started using the compost that has matured for the last 9 months, we are thrilled with the quality of the compost we have made!"

Stoke Hill Infant School



Different composting systems



Worms

Static composting systems, such as the HotBox, Pallet bin and New Zealand box are really big wormeries! Compost or manure worms (the striped 'tiger worms' are the most obvious) naturally find and colonise compost equipment or heaps. Over several months, firstly bacteria, fungi and other micro-organisms and later the worms, break down the materials transforming it into a rich dark humus. You may also see masses of small white worms known as pot worms. These are harmless but can indicate that your compost is getting a bit wet, acid

and airless. If this is the case, see trouble shooting guide on page 41.

In a thriving heap you may also see little brown worm eggs, known as cocoons; these look like grape pips.

It's fascinating to take samples of the different stages of composting; look carefully at it with hand lenses and microscopes to see the incredible diversity of invertebrates and other life living there. You will see a couple of short videos showing these creatures on www.dccn.org.uk



Different composting systems

Composting raw and cooked food waste



Composting cooked food comes in two stages – an ‘initial’ stage which requires specialist turning equipment, and a ‘maturation’ stage which can be done in a static system such as a HotBox, Pallet bin or New Zealand box.

If you want to compost raw and cooked food waste

Initial stage

This stage is rapid and eventful. If you have added the right mix of materials, then heat will be generated and steam will be visible. Initial stage composters are designed to allow you to tumble or turn the mix every day – this increases airflow which stimulates heat production. Temperatures inside the initial stage composter should reach 50-60°C which is enough to rapidly kill off potentially dangerous pathogens and fly larvae. It is vital that wood pellets, sawdust or wood chips are added at the same time as the fresh and cooked food waste; more on this later. After the food waste has been through the initial stage equipment, it still needs time ‘to mature’ before it can be used on the land – this is where the next stage begins. Equipment for this stage includes the Ridan which comes in three different sizes and the Jora for very small amounts of food waste – see pages 17 to 18.

Maturation stage

Food from the initial stage composters is not ready to be used on the land and so should be transferred to another composter for the maturation stage. This stage is slower, cooler and will generally take 9 - 12 months or even longer. Equipment for this stage includes HotBoxes, pallet bins or New Zealand boxes – see pages 10 to 14.

Initial stage equipment

These composters are designed to compost food not garden waste, however freshly cut grass is probably the best compost activator around and the odd bucketful will raise the temperature quickly, so can be used to rectify compost that will not heat up! Be careful not to overload it with grass though, as this will be counterproductive.



Different composting systems



For large amounts of food waste the Ridan series is a good option

| | |
|-------------------------------|---|
| Description | <ul style="list-style-type: none"> • Insulated turning composter |
| Size | <ul style="list-style-type: none"> • Three different sizes |
| Dimensions | <ul style="list-style-type: none"> • Mini Ridan = L2.1m, H1.5m and D1m • Standard Ridan = L2.2m, H1.6m and D1m • Large Ridan = L2.4m, H1.7m and D1m |
| Amount of food waste per week | <ul style="list-style-type: none"> • Mini Ridan = up to 40kg • Standard Ridan = up to 75kg • Large Ridan = up to 200kg |
| Delivery format | <ul style="list-style-type: none"> • Pre-assembled |
| Where it is made | <ul style="list-style-type: none"> • Designed and manufactured in Devon |
| Number of chambers | <ul style="list-style-type: none"> • 1 – it has a rigid metal pipe running through the whole length with paddles (see image above) which turn and ease the food waste through the system towards the outlet pipe at the far end |
| Locating the equipment | <ul style="list-style-type: none"> • Ensure Ridan legs are on solid ground, or place a flagstone under each leg, in a clean and clear area, away from hedges |
| How they work | <ul style="list-style-type: none"> • Fill at one end and turn handle, each time the handle is turned partially composted food waste that has reached the end falls out. This is then emptied into the maturation bin. • Never fill the Ridan more than three quarters full as you need a flow of air to pass right along the mass of material inside, and always replace the lid properly • Refer to troubleshooting guide if any issues arise – see page 42 |
| Number of turns daily | <ul style="list-style-type: none"> • 15-20 or as much as it takes until there is a clear airspace visible in the filling chamber – don't worry about weekends |
| Wood source needed? | <ul style="list-style-type: none"> • Yes! Every time food waste is inputted add a wood source |
| Additional information | <ul style="list-style-type: none"> • The Ridan differs from the Jora in that materials are harvested every time fresh materials are added and the handle is turned. • Roughly 6 buckets of food waste in = 1 bucket of compost out • If leaving a bucket under the Ridan output, drill holes in the bottom of the bucket to allow drainage of water |
| Website | <p>www.ridan.co.uk</p> |



Different composting systems



For smaller amounts of food waste you can use a Jora 270

| | |
|-------------------------------|---|
| Description | <ul style="list-style-type: none"> • Turning compost bin with insulating lining |
| Size | <ul style="list-style-type: none"> • 270 litres |
| Dimensions | <ul style="list-style-type: none"> • L116 x H88.6 x D88.6cm overall with stand |
| Amount of food waste per week | <ul style="list-style-type: none"> • Up to 15kg |
| Delivery format | <ul style="list-style-type: none"> • Flat packed – ideally needs two people to assemble |
| Where it is made | <ul style="list-style-type: none"> • Designed in Sweden and manufactured in China |
| Number of chambers | <ul style="list-style-type: none"> • 2 |
| Locating the equipment | <ul style="list-style-type: none"> • Ensure Jora’s legs are on solid ground in a clean and clear area, away from hedges |
| How they work | <ul style="list-style-type: none"> • Fill one chamber until three quarters full, then start to fill the second chamber. Turn each day. When the second chamber is three quarters full, empty the first into the maturation system and start to refill Refer to troubleshooting guide if any issues arise – see page 42 |
| Number of turns daily | <ul style="list-style-type: none"> • 6ish - don't worry about weekends |
| Wood source needed? | <ul style="list-style-type: none"> • Yes! Every time food waste is inputted add a wood source |
| Additional information | <ul style="list-style-type: none"> • The Jora comes in two leg lengths. The shorter legs make it easier for children to see inside, however, the longer leg option means that it stands high enough for the contents to be emptied into a wheelbarrow • The website says that they can be mounted on a wall, however due to health and safety issues, we would not recommend this |
| Website | <p>www.smartsoil.co.uk/jk270.htm</p> |



Additional equipment

As well as your turning composter and/or HotBox, Pallet bin or New Zealand box, there are other pieces of equipment you will need to ensure your composting runs smoothly:

Food caddies/buckets

You will need collection containers for your food waste situated around the school wherever food waste is generated. These need to be emptied daily, so do not need to be very large. Most schools find that a couple of 23 litre food waste caddies are sufficient for the school dining hall, while classrooms need a 7 litre caddy. Don't forget a caddy for the staffroom! Choose easy to clean containers with lids (to keep out flies if left outside) and handles. Lining them with newspaper will reduce the amount of cleaning needed, and the newspaper can go into the composter. It is helpful to have them clearly labelled (with words and an image for the younger children) so that adults and pupils know what should go into them.



Gloves

When you do your school compost risk assessment (see resources section on page 44 for a template that you can amend for your schools needs) you may decide that your compost operator(s) should wear gloves. Strong waterproof gardening gloves can be sourced from garden centres or online.



Probe thermometer

Healthy composting needs warmth, so you will need to monitor the temperature of your initial stage composter on a regular basis. A probe thermometer costs about £10 and is easy to use by adults and pupils (under supervision.) Like all thermometers, they need to be handled and stored with care to avoid damage. A cardboard tube, such as the ones used to store posters, will protect your thermometer and prolong its life.



Hand washing facilities

Even if your compost operator(s) are wearing gloves, good hand-washing procedures are essential, so make sure you have a good supply of soap. Ensure that any pupils helping with any aspect of the composting process get into the habit of washing their hands afterwards.



Additional equipment

Storage bin

Wood chip/pellets need to be kept dry and located near/next to your initial stage composter for daily inputting. A plastic bin with a well-fitting lid is ideal and can be sourced from a garden centre/DIY store for about £10. Alternatively, you might be able to get an old wheelie bin from your local recycling centre (see resource section on page 45).

Scoop

A simple scoop is useful for transferring wood chip/pellets into your composter. You can make one from a 2 litre plastic milk bottle, demonstrating reuse, or buy one for about £5 from a wide variety of shops such as those selling dry pet/animal food.



Wheelbarrow

For moving the compost from one system to another, or to the garden.



Bucket

If you are using a Ridan composter you will need to place a bucket, trug or similar container underneath the outlet pipe to collect the compost. It is recommended that you drill a few holes in the base of the bucket so if it is left beneath the Ridan outlet in the rain, the water drains through it.

Spade

A spade is very useful for moving/mixing the compost.



Mantra for successful composting



Composting is a living process carried out by countless macro and micro organisms. To keep them happy and healthy follow the four point composting mantra:




Food

The materials you add to any compost system become food for the organisms that create the compost. Getting the right mix of these materials provides air, water and nutrients which are vital for the wellbeing of all the life in the system.



Water

Compost organisms also need water. Raw fruit and vegetables are mostly water so it is rare that you need to add more to a turning composter. The most common problem is lack of water inside a HotBox which gets full of dried out materials and the composting process comes to a standstill. If this happens add water, preferably rain water; see the trouble shooting guide in the resources section on page 41. Pallet bins or New Zealand boxes do not usually have lids and so usually get enough water from rainfall.




Air

Compost organisms need oxygen to thrive. Air gaps are provided by the woody material (wood chip or wood pellets) that are mixed with the food waste.



Warmth

Compost organisms generate heat, but they also need warmth to get going. The composters described in this booklet e.g. HotBox, Jora and Ridan are all insulated to maintain warmth; a full HotBox has sufficient mass of material to keep the centre warm during the coldest conditions.



Food: A balanced compost diet

A healthy compost system needs a balanced diet of both:

Nitrogen

Think 'Water' – green, wet items such as vegetable peelings, fruit waste, grass cuttings, weeds (but avoid tough roots and seed heads) and cooked food.

These add moisture and are an easy source of food for compost organisms to grow and reproduce. If you have decided to compost cooked food you must include equal amounts of raw 'green' materials. If the proportion of cooked food is too high it will lead to a cold and lifeless compost.



And

Carbon

Think 'Air' – brown, dry items such as wood chip, wood pellets, dry plant stems and small twigs.

These add structure, air gaps and are a longer lasting energy source for the compost organisms. Avoid adding large twigs and garden clippings to your food waste system as these will take longer to break down than other materials.



The most important concept to bear in mind is that both air and water are vital for life and you need equal amounts of both.



Food: A balanced compost diet

Carbon - the magic ingredient!

Dry, carbon rich materials, such as wood chips, wood pellets, sawdust or cardboard, are vital for effective composting; they add structure to the composting process, which allows for the flow of air and liquid and must be added at the same time as the soft wet materials. Woody materials are particularly essential to food waste composting as they are solid and maintain air spaces when mixed or layered with the wet food waste. Ideally, the carbon source should be kept dry.



"I am really pleased with using wood pellets instead of wood chip for my composting needs – it is so much easier, less bulky, quicker and still makes lovely compost – a real winner. It is less problematic to deliver wood pellets to schools and store than wood chip due to its smaller bulk."

Okehampton Primary School

However, if you want to find a **FREE** carbon source you could consider some of the following options:

Paper and cardboard: Waste paper and cardboard are abundant in schools and maybe added to supply carbon to your bin/box raw food waste composting system. However, do not use this in a turning system as it will quickly ball up and reduce the air flow.

Wood chip: Ask parents/governors/staff if they have any friends or contacts, such as tree surgeons, who can supply either fresh or dry wood chip – or contact local tree surgeons who may be very happy to support your school's composting. It is important to store your wood chip where it will not get wet.

Wood shavings: Uncontaminated (no MDF, tanalised or painted wood etc.) wood shavings are fine on their own or in combination with other wood sources.

Sawdust: Uncontaminated (no MDF, tanalised wood etc.) sawdust will work well in conjunction with wood chip, and maybe available as a 'waste' material from carpenters. It is advisable to wear a face mask when using it as the dust could be a health and safety issue.

Wood pellets: These are ideal for raw food waste composting systems as they can be raked out in the Hotbox. However, keeping large volumes of wood chip dry can be a challenge. Many schools find wood pellets, purchased in convenient bags, an easier option for combined raw and cooked food waste composting.

It is important to store wood pellets in the dry as well because if any moisture gets in it will swell up the pellets and burst the sacks.

When considering the financial implications of buying wood pellets, think about getting together with other local composting schools to put in a bulk order to benefit from economies of scale. Also remember that your school may well save money on rubbish collections once your composting is firmly established.



Food: A balanced compost diet



Wood chip sieving:

The downside of using large, structural materials to aid the composting process is that when you empty the compost from your bin/box, some large woody bits will probably still be present. If you dig them into your garden the micro-organisms will continue to break them down, a process which uses nitrogen from the soil. Nitrogen is vital for plants to grow, so to avoid this you can either adopt a 'no dig' approach or sieve out the large bits before using your compost.



Any really large chunks of wood can be returned to your compost system, adding valuable microbes. However, sieving can be laborious with a small sieve; instead it could be a task that the children can do. Ask them to hold either end of a length of chicken wire so that it forms a U shape, a foot or so from the ground. One of them holds the chicken wire while the other puts a forkful of compost onto it at a time. Rock the wire from side to side, rolling the compost through leaving the larger pieces on top of the wire, these can be used again.

Proportions of carbon to food waste

In a raw food only composting system

Suitable carbon sources include wood chips, sawdust and some cardboard. A mixture of different sources of carbon is beneficial as they add different sized air gaps:

The materials should be layered into the bin/box in the right proportions of:

**1 caddy of raw food waste to
1 caddy of wood chips/sawdust**

Or ~~~~~

**1 caddy of raw food waste to
half a caddy of wood chips/sawdust,
and a layer of cardboard**

In a raw and cooked food composting system

Using a tumbler, suitable carbon sources include wood chips, sawdust or wood pellets. Wood pellets are compressed sawdust, which absorb moisture and expand when mixed with food waste in a turning system. Cardboard shouldn't be added to a turning system as it will clump up and become tangled in the mechanism.

The wood source should be added to the turning composter in the right proportions of:

**1 caddy of food waste
(mixture of raw and cooked) to
1 caddy of wood chips/sawdust**

Or ~~~~~

**1 caddy of food waste
(mixture of raw and cooked) to
one sixth of a caddy of wood pellets**



Starting a new composting system



Composting cooked and raw food waste

In your turning system, add the three buckets as in the box on the left, then tumble well to ensure the materials are thoroughly mixed and plenty of air is incorporated. If you are using a Ridan, turn the handle 15-20 or as much as it takes until there is a clear airspace visible in the filling chamber. If you have a Jora, then turn it about 6 times.

On the following days, add fresh food waste and wood chips/pellets in the right proportions (see page 24), and tumble/mix well. Always add your food waste daily - do not leave it lying around in buckets to go smelly!

Start your composting with just raw food (fresh peelings and fruit waste), with the all-important wood source, and take the temperature of the mix each day. When it reaches around 50°C, start to add cooked food: 1 day the first week, 2 days the second week, 3 days the third week etc. Continue to monitor the temperature – if it drops, have a day or two without adding cooked food waste. Over time, aim for roughly equal volumes of cooked and raw food waste with your carbon source as this mix will provide the best conditions for composting.

If you do not have a production kitchen at your school (where meals are cooked, not just heated up) you may find you have a shortage of fresh peelings to balance your cooked food. In this situation, add small amounts of grass or other leafy garden waste to give your initial stage composter a boost. During the start up phase, for the first few weeks, it's best to make sure that the air supply, in the form of wood chip/wood pellets is more than the advised amounts rather than less. If you start a system without enough structure, it can easily become airless, start to smell and then it's difficult to get it back on track. Keep adding a balance of wet/green materials (e.g. fresh fruit and vegetable peelings) with dry/brown structural material (e.g. wood chip or wood pellets). See compost mantra on page 21.

Avoid putting lots of very wet materials such as gravy, custard, milk or soup in, as this will block up all the air spaces and can make the compost smelly.

Composting raw food waste only

On day 1, add the following to your bin/box and rake it level:

- A bucket of dry wood chip/sawdust (a mix of both is fine)
- A bucket of fresh 'greens' such as fruit and vegetable peelings.
- A bucket of composting material from an active onsite compost heap, if at all possible, as this will kick start the microbial populations

On the following days add raw food waste and rake level in the bin/box. Then follow with an equal proportion of your carbon sources, including at least some wood chip/sawdust, and rake level to cover the raw food waste.



Using your compost



After your compost has matured for 9 -12 months it will be ready to use. Sieve out any very large chunks of wood chip. It is best to use your finished compost on the garden bed surface and not dig it in. The worms in the soil will soon incorporate the finished compost and the harder bits will remain on the surface slowly breaking down.

Using your compost to create new beds: Lasagne mulching

Digging disrupts the delicate soil ecology and spades slice up and kill earth dwelling worms. With around 50 - 300 earthworms in a square metre of healthy top layer soil, digging can do more harm than good. Of course if you have pernicious perennial weeds such as bindweed, couch grass, ground elder etc. then you will probably have to do some digging, but if your ground is mostly covered with annual grasses and weeds then the easiest way to prepare it is by 'lasagne mulching'. You can do this at any time of year but ideally not when the ground is really dry.

For lasagne mulching you will need:

- Large sheets of cardboard/old cardboard boxes, with the packing tape, plastic and staples removed
- Old newspapers
- A watering can or hose
- Various types of organic material such as:
 - Grass clippings
 - Compost
 - Manure
 - Partially rotted wood chip
 - Leaf mould

Firstly, scythe or mow off all the top growth vegetation then lay the sheets of cardboard over the area. Cover the sheets with newspapers especially where they overlap and use a watering can to mould the newspaper to the cardboard. If you had a lot of top growth you could spread this on top of the newspaper layer. You can add all kinds of bulky organic material in layers, for example, compost (it doesn't have to be fully mature for this job), leaf mould or manure. You can finish off with fresh or partially rotted, wood chip, straw, hay etc.

This method will clear most weeds but not all. Some weeds are incredibly tenacious, however any that push through, such as docks, can often be pulled out of the loosened soil with complete roots. Potatoes are a great crop to plant into this mulch in the spring because it's easy to harvest them and clear up any remaining weeds at the same time. If you make the beds later in the season you could plant pot grown squashes, or, if preparing in the autumn then you could sow broad beans in November. If the lasagne mulch has been down for some time then you can make holes through the layers and plant directly into the soil beneath.



Using your compost

Using your compost on already prepared beds

If you already have lovely well-tended beds, then use your matured compost on the soil surface, or during the growing season apply around growing crops. After harvesting, clean up the beds, rake and apply a top dressing after sowing or planting out the next crop. Think of your compost as adding a dose of life-giving beneficial micro-organisms. A little goes a long way so even if you only have enough for a thin covering, it is all food for the soil and will help boost the life in your garden. Always plan the next crop to go in and try not to leave the soil bare, as this will lose its fertility and life.



Using your compost as a potting medium

Your fully mature compost will form a great basis as a growing medium for plants in pots or tubs etc. Firstly you will need to sieve it (see page 24), then add sharp sand, available from garden centres, not builders sand, perlite or vermiculite to introduce air gaps and improve drainage. Pure compost tends to be too sticky and holds water, so just as you had to add wood pellets or chippings to allow air and water through the active compost, now you need to add a mineral amendment, such as sand, to allow the same process in the finished compost. How much depends on the plants you are growing and how long they are going to be in the container. Leaf mould, mixed with sharp sand, is good to grow seeds in; for more information see the resource section from page 41.



Top tips for successful composting

General tips

1. Add fresh materials daily to your initial stage composter – do not leave waste hanging around in buckets/caddies getting smelly and attracting flies.
2. Ask if any parents or governors have a tree surgery business and could supply and deliver DRY wood chips or sawdust to you on a regular basis.
3. Store your wood source in an old plastic dalek composter or dustbin to keep it dry. You may be able to get one of these from your local recycling centre. Place your storage container next to your composter for easy access.
4. Line buckets/caddies with newspaper to soak up liquids and make cleaning them easier.
5. Always make sure you have the right mix of wet/green/nitrogen and dry/brown/carbon materials.

Composting 'raw food waste only' and the 'maturation stage' of raw and cooked food composting



1. Small amounts of cardboard and shredded paper can be added to the box/bin.
2. Check the moisture levels in your box/bin regularly. If moisture levels are correct, then the compost should yield a few drops of water; you may well want to wear gloves to do this.
3. Another method to check moisture levels is to stand back and observe when you take the lid off the composter. Watch out for any rising mould spores which are a sign that it is too dry. If this happens, wear a face mask, or be careful not to breathe in the spores; soak the contents in water and leave undisturbed for several days. This can also enable the heap to become active again and continue composting.



Top tips for successful composting

Raw and cooked food waste composted together in a turning system

1. Start using wood pellets until you are confident in using your composter, later you could consider changing to wood chip which you might be able to source free of charge. At first, err on the side of too many rather than too few pellets and make sure that you turn the handle plenty of times after adding.
2. Avoid overfilling your turning system as you need to leave space for air flow and for turning.
3. It is rare for the compost to be too dry in turning composters, but if it does seem dry, it's better to add fresh greens such as grass cuttings, fruit or vegetable peelings than water.
4. Avoid adding lots of wet, sloppy materials like soup, gravy or custard etc.
5. Tumble and mix every time you add fresh materials.
6. Observe what is going on and take steps to rectify any problems as soon as possible. If things have gone wrong it's best to empty the contents of the turning composter into the box/bin and start again. However, if things have gone 'drastically' wrong, then, you could instead, empty the turning composter into your general rubbish bin and seek advice (see contacts section) and then start again.
7. Cardboard and paper should not be added to a turning composter as it tends to ball up; balls of soggy cardboard offer no structure or air pockets.
8. Chain the turning handle to the leg of the Ridan if appropriate to stop misuse (pictured below).



Make it happen within the school

Support

Make sure you have the support of the whole school community, especially the Head Teacher/ Governors/Kitchen staff/Meal Time Assistants and Caretaker. Without this support, you will struggle to compost effectively.

Food Waste Audit

Schools should collect and weigh all their food waste for 5 days, this should be separated out into raw food (fruit and kitchen peelings) and, if you wish to compost this, cooked food (plate scrapings and left over servings).

This not only gives you a baseline on which to compare when food waste reduction systems have been put in place, but also will inform you what type of composting system will be most appropriate

for your school. The 5 day food waste audit sheet can be found on page 43.

An excel version of this can be found on zone.recycledevon.org/compost

which will automatically create tables and graphs for you to use with the children.

After completing this, if you would like advice on which composting system is appropriate for you then email the completed form to

recycle@devon.gov.uk.



Communications

Talk to everyone involved at the school before you purchase the composting equipment to iron out any concerns before you start. This will include the Head Teacher, Caretaker, Kitchen Staff, Meal Time Assistants, Bursar and other Teachers.

Composter location

The turning composter should be located away from hedges and fences, reasonably near the kitchen and area where the food is eaten for ease of daily emptying. The bin/box can either be here, or in the garden where the compost is to be used. Try to locate any composters away from school building windows so that if they do start to smell then it won't affect anyone. If this happens see the trouble shooting guide on page 41 or 42 to rectify the situation.

Caddy location

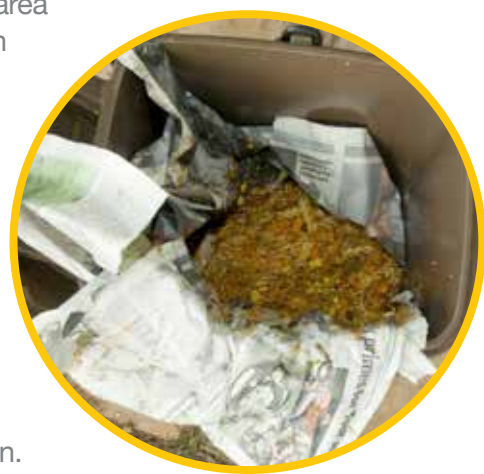
Put caddies in all the areas where fruit and snacks are eaten. A large caddy, or two depending on the size of the school, should go into the kitchen for food preparations.

A large open bucket or caddy should go into the area where food is eaten

for plate scrapings (if you decide to compost this).

You may also need collection caddies in the playgrounds.

All buckets and caddies should be monitored to avoid contamination.



Make it happen within the school



Combat contamination

Clearly label all the food waste collection caddies using pictures and text to help younger children.

You could consider involving pupils in designing the labels to increase their sense of ownership.

Make sure all school adults know what should, and shouldn't, go in the caddies so that they can guide the children. It is worth doing termly assemblies as a general reminder to everyone.

Team effort

Use pupils from your gardening/eco/green team, or perhaps start a special 'Little Rotters' group. They can collect the caddies and put them next to the composter for when you empty the food waste into it. The caddies then need to be cleaned and replaced in their locations ready for the next day. If the work is popular enough with



the children, make a rota of responsible children involving all the year groups to increase the feeling of ownership of the composter throughout the school.

Spread the word

Encourage your composting group to create a dedicated 'Eco' notice board and hold an assembly to tell the rest of the school about the great work you are doing. Let parents know by inviting them to the assembly, putting an article in the school newsletter and on the website. Connect with a local gardening group/allotment users/keen gardener to talk to and work with the children. Use the compost you have made to grow flowers, fruit and vegetables in the school grounds – thus completing the nutrient cycle. Even better for the children's learning would be to harvest, cook and eat the vegetables within the school day.

Collecting and using data

You can weigh the different types of food waste and wood that you are inputting into the composter and take the temperatures inside and outside. These will enable you to learn what the composter needs to keep it running well. The records can also be used as part of numeracy or IT lessons. For more ideas see the Compost Curriculum Handbook on page 40.



Case studies



| | |
|----------------------------|--|
| School | Marpool Primary |
| Learning Community | Exmouth |
| District | East |
| Number of pupils | 430 |
| Equipment | Large Ridan and 4 HotBoxes |
| Amount composting | 155kg/week - they cater for 2 other schools (460 meals cooked each day) |
| Wood source | Woodchip, sourced free from a parent who has a landscape gardening business. He delivers a dumpy bag load when requested |
| Bin reduction costs | The wonderful food waste composting and recycling work has meant the school have reduced their black bag waste from three to two 1100 litre bins per week |
| Other details | <p><i>Marpool decided to make composting a team effort. This is important not only to spread the work load, but also to embed it into school life and make it more sustainable; if one team member leaves, then others can take over.</i></p> <p>The Green Team</p> <p>A Class Teacher: manages of the Green Team. She, or a Teaching Assistant, oversees the actual day-to-day recycling/food collection/Ridan turning with the children.</p> <p>A member of the kitchen staff: puts out the cooked food waste for the children to collect, she keeps an eye on the Ridan area (it's directly opposite the kitchen), checks the HotBoxes and requests woodchip when required.</p> <p>The Governor: writes the funding applications and contacts local businesses to source free resources. She has been instrumental in getting the solar panels for the school. It is useful to have a Governor involved to keep the governing body informed of what the Green Team are doing.</p> <p>Head of the Kitchen: has helped implement the take home waste packed lunch policy, collection of cooked food waste etc.</p> <p>The Caretaker: passes on messages to the cleaning staff e.g. collecting the rubbish for the waste audit and generally keeps an eye on the Ridan area.</p> <p>The Head Teacher: is kept informed of how the scheme is going, she sometimes gets involved and is really supportive.</p> <p>Pupils: The children collect the fruit peelings from caddies around the school and put them in the Ridan. Under adult supervision they add wood chippings, turn the Ridan and transfer the compost to the HotBoxes. They regularly clean the caddies and tidy up the Ridan area. The same group collect the recycling from around the school (bins in all areas and every classroom) and sort it into the correct bins. The children make labels for the recycling containers and caddies to remind others what can/can't go in. The recycling group did a whole school assembly reminding children (especially the new children) what can/can't go in the recycling bins and to use the fruit caddies at break.</p> <p>The gardening club use the compost to grow vegetables and herbs, and some KS1 children used it to plant spring bulbs in pots to give to parents as a Christmas presents. Two boys did literacy work where they explained their recycling and composting roles. They visited all the KS2 classes telling the other children about their role and showing photos of what they do. They took each class out to the Ridan and let each child turn it.</p> <p>This combined team effort means the school achieves an 81% recycling and composting rate – fantastic result.</p> |



Case studies

| | |
|---------------------|---|
| School | Morchard Bishop Primary |
| Learning Community | Chulmleigh |
| District | Mid Devon |
| Number of pupils | 99 |
| Equipment | 2 HotBoxes |
| Amount composting | 27.5kg/week in total (5kg of raw veg from the kitchen, egg boxes and 22.5kg fruit waste) |
| Wood source | Some garden waste, paper towels and cardboard (this is ok in a non-tumbling system, but not for a Ridan) |
| Bin reduction costs | With an improved recycling system and the introduction of composting, the school was able to reduce their one 1100 litre bin for black bag rubbish to two 240 litre bins per week, thus saving £187 per year |
| Other details | <p>An established group of Eco Warriors from year 5 oversee the recycling and Mini Warriors from year 2 collect the fruit waste for composting. Children from year 3 take turns to check on lights and power use around the school. They are recycling plastic milk containers, paper and kitchen tins through free district council collections, and cardboard is collected and recycled in the village.</p> <p>Pupils are involved in collecting the fruit and vegetable waste, taking it to the composter, and layering it up with 'browns' wood chip. They then use the compost on the garden when it is ready.</p> <p>With support from the Waste Education team, in just seven months, this school increased its recycling rate from 9% to 62% and reduced their black bag waste by 80%.</p> |



Case studies

| School | Landscape Primary |
|---------------------|--|
| Learning Community | Crediton |
| District | Mid Devon |
| Number of pupils | 308 |
| Equipment | Standard Ridan and three HotBoxes Some garden waste, paper towels and cardboard (this is ok in a non-tumbling system, but not for a Ridan) |
| Amount composting | 64kg/week |
| Wood source | Wood pellets |
| Bin reduction costs | Through composting all their food waste, Landscape Primary has reduced their black bag waste by one 1100 litre bin per fortnight, therefore saving the school £486 each year |
| Other details | <p>Landscape started composting back in 2006 using the Rolypig. They then moved on to using two Jora 270s but as these did not have enough capacity; the Standard Ridan was purchased in 2010. The school has a very active 'Little Rotter' group who do the gardening, recycling and composting work. They record the weights of the cooked and raw food waste and the amount of pellets they use. This information has inspired them to try to reduce the amount of cooked food waste they produce. The children are going to investigate what food is commonly left in the plate scrapings and whether portions are too big for some pupils; they will communicate their findings back to the kitchen staff. The children will also look at the food waste from packed lunches and the amount, and type, of packaging used.</p> <p>Another idea is to look at the whole food procurement issue and link up with local growers and farmers. "If schools realised they can get all their composting and recycling managed really effectively by re-deploying a committed mealtime assistant, I'm sure a lot more of them would be doing it, especially because schools need to take an active role in reducing the schools costs." Gary Read, Head Teacher.</p> |

"Landscape Primary is a beacon school for composting cooked food waste and is willing to show interested teachers around its facilities."

Gary Read, Head Teacher



Case studies

| School | Whipton Barton Junior |
|---------------------|--|
| Learning Community | Exeter - Beacon |
| District | Exeter |
| Number of pupils | 250 |
| Equipment | Big Hanna and three HotBoxes |
| Amount composting | 217kg/week – they cater for 2 other schools; nearly 300 meals a day |
| Wood source | Wood pellets |
| Bin reduction costs | As a result of composting food waste and other waste reduction measures they have reduced the number of 1100 litre black bag rubbish bins from three to two collected per week, saving £320 per year |
| Other details | <p>Two compost operators were appointed by the school; the premises manager – to oversee the day to day running of the equipment and a TA/leader of the Green Team – to involve the rest of the school in composting.</p> <p>The operation of the Big Hanna has been a great success. The Premises Manager takes about 15 minutes a day to input the food waste. He quickly learnt to trust his own judgements to make adjustments to the wood pellet amounts inputted according to his own observations and the temperature of the food waste. He thinks that the cost of wood pellets has been balanced by the reduction in rubbish bin collection costs. The school has recently replaced the soil in their many raised beds with their school made compost, saving even more money by not buying in compost.</p> <p>The Big Hanna has been fully integrated into the schools life and this has been publicised to the wider community. This includes:</p> <ul style="list-style-type: none"> • A Big Hanna opening ceremony with the Deputy Mayor and press present • Further press coverage from the Express and Echo • Overseeing the collection of food waste caddies by the pupil Green Team • Creating a compost notice board for pupils, staff and parents • Supporting the Green Team to deliver an assembly about composting to the rest of the school • Ensuring that the school's gardening club has been actively involved in composting • Train MTAs to help them understand the use of the composter and ensure the children do not put contaminants in the caddies • Working with the science coordinator to plan composting sessions in the summer term which link in with the curriculum |



Case studies

| | |
|---------------------|--|
| School | South Molton |
| Learning Community | North Devon |
| District | Exeter |
| Number of pupils | 600 |
| Equipment | Standard Ridan and three HotBoxes |
| Amount composting | 56kg/week |
| Wood source | Wood shavings and sawdust from DT department |
| Bin reduction costs | South Molton Community College is a fantastic example of food waste reduction initiatives, resulting in less than half the amount of food waste expected for a secondary school of this size. All plate scrapings and kitchen waste goes into 1 x 23 litre caddy each day. As much food is consumed in the canteen at break time (when students can have beans on toast, bacon rolls etc.) as is eaten at lunch time. All this work has resulted in them reducing their bins from 9 x 1100 litre bins collected weekly to 8 x 1100 litre bins, saving £410 per year. |
| Other details | <p>This reduction in food waste is mainly due to the Catering Manager:</p> <ul style="list-style-type: none"> • organising a 'canteen committee' consisting of students from each year group from the school council. They meet twice a year to feedback students' comments about the food and canteen experience • offering tasters of new meals before making a large amount • being given at least 3 weeks' notice of large absences (e.g. school trips) so she can reduce the amount of meals accordingly • cooking very tasty, healthy meals <p>Also</p> <ul style="list-style-type: none"> • 15-20% of the students have packed lunches which they can eat in the canteen with their friends, making it a social experience • in summer, meals can be taken to an outdoor eating area which has been designed and made by the students <p>Another initiative here is that the composter is fed with wood shavings and sawdust from the Design Technology department making it self-sufficient in a wood source. This not only saves money from not needing to buy a wood source, but also stops the college paying for it to be taken away. Win, win!</p> |



Frequently asked questions

Can I sell or give away the compost we make?

No – due to the Animal By Product Regulations you must use the compost you made in the schools composter, on the school grounds. However, you can sell any excess seedlings or plants that you grow and these can be grown in the compost you have made. Sieve some of the compost, add some sharp sand, vermiculite or perlite for drainage to make it suitable to germinate seedlings in and pop it in a yogurt pot!

Paper towels - can they be composted?

It is best to leave paper towels out altogether as they do not add structure or air to a heap, they merely absorb some of the moisture. They will compost, but the volumes generated by schools mean that realistically you will not be able to compost more than a handful at a time.

Cardboard and shredded paper – can this be composted?

Cardboard and shredded paper can be used as part of the carbon source in a bin/box only composting system alongside plenty of wood chip or sawdust to add air gaps. It should not be added to a turning composter, although it can be used to line caddies, and added in very small quantities.

Can I put leaves in the HotBox?

It is best to keep leaves out of the HotBox as they take a long time to break down and take up a lot of space that could be composting your food waste. You could make your own leaf mould container instead see zone.recycledevon.org/sites/default/files/Leaf_mould_-_Garden_Organic_leaflet.pdf

Do I need to add worms to the HotBox/Pallet bin/New Zealand box?

Worms should find their own way into these composters, but there is no harm in adding some yourself from a compost heap nearby, although do not add worms which you have dug up, as they are different species and will not thrive in the compost heap.



Frequently asked questions

Will the composter smell? Will it attract flies?

A healthy composter which has a good balance of materials should only have a very mild smell and should not attract flies. If your raw food waste composter is smelling or attracting flies you need to add layers of dry materials, to cover the food waste. If your turning system is smelling or attracting flies you will need to add more wood chip/pellets/sawdust and decrease the proportion of cooked food going in. You can do this by either by putting it somewhere else for a while, or adding more 'raw' materials such as grass clippings. Hygiene is also important; the caddies, composting equipment and its surrounding area should be kept clean.

Where can I get wood chip/wood pellets?

Wood chip can be sourced locally through tree surgeons or saw mills – look in the yellow pages. You could also ask your pupils' parents if they know of a source. Wood pellets have to be paid for but are easier to use and store, email recycle@devon.gov.uk for sources.

Where can I get a container in which to store the wood chip/wood pellets?

You can buy old dustbins with a lid/plastic dalek composters in which to store wood chip and wood pellets cheaply from your local recycling centre. See contacts section for a map of their locations.

www.recycledevon.org/recycling-facilities-projects-community-groups

How long will the food waste be inside the turning composter?

It is estimated that food waste is inside the Ridans for approximately two weeks before coming out the other end. The Jora needs to be emptied before it gets overfull, whatever the contents may look like. Depending on the volumes you are putting through the system (and this will change from school to school and even week to week) the material coming out will vary in its degree of decomposition, but as long as most of the material has started to break down it's fine to transfer to the maturation bin. You could add a tennis ball to your Ridan; note the date and wait for it to come out the other end!



Frequently asked questions

Can we put any sorts of plastic into our composter?

Avoid putting any plastic into any composting system as it will not compost, even if it says 'degradable' on it. Degradable just means that it breaks down into lots and lots of tiny pieces of plastic which you would then spread onto the school gardens. There are some fully biodegradable, compostable plastics which are commonly made from potato and/or maize starch, however they seem to take an awfully long time to break down, they also need sunlight to help them disintegrate. Generally our advice would be to avoid putting these in your composting systems.

What should we do about our composter over the school holidays?

Ideally, it is best to empty your turning composter before the longer school holidays, if you cannot do this then it's not the end of the world. Your composter will be fine, however if anyone is around it will appreciate an occasional turn; without turning the composters temperature will cool down. However, as soon as you start inputting and turning the system, the micro-organisms will get to work and the temperature will increase very quickly.

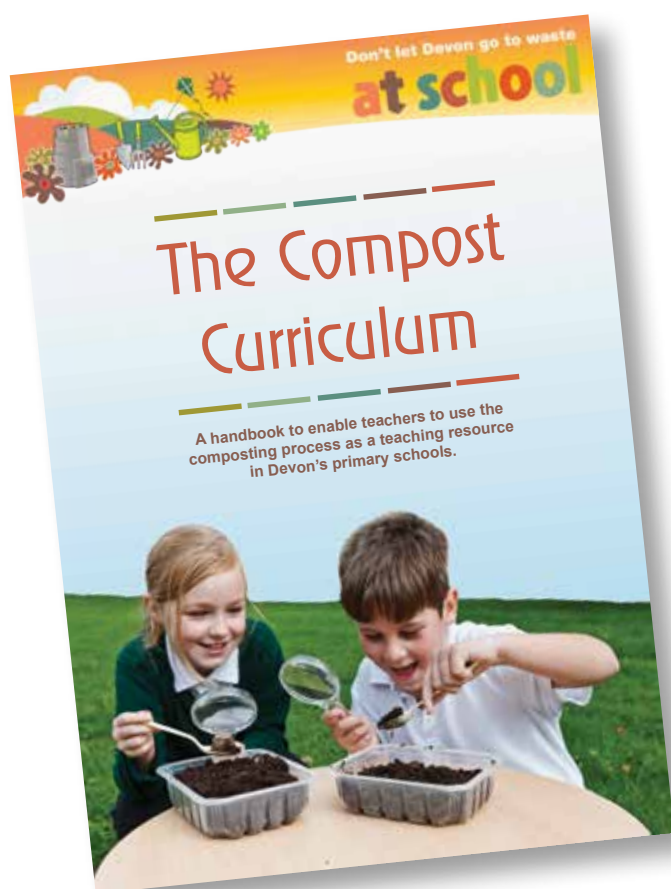
If your Jora has been left for a long period the contents will reduce in volume and density and it's tempting to add more fresh materials without emptying, however you can end up with an extremely heavy mass of material to turn and you can even bend the legs of the Jora, so do empty it regularly!

HotBoxes, New Zealand Boxes and pallet bins can be left over the holidays.



The Compost Curriculum Handbook

By using your composters as a learning resource you will bring the curriculum to life for pupils AND ensure that the composter becomes an integral part of the school. Involving pupils in the practical side of composting can make the curriculum accessible to those pupils who prefer learning outside, in less formal situations and by doing practical tasks.



The composting process can be used to address primary curriculum requirements. The obvious links are with the science curriculum, but there are also plentiful opportunities to use data from the composting process in maths and IT work. Of course with a little bit of imagination you could incorporate composting into every subject! With time you should be able to ensure that every year group uses the composters as a resource for at least one classroom topic a year.

Compost Curriculum Handbook

We have created the Compost Curriculum Handbook. It doesn't matter if you are a complete beginner, or a seasoned rotter; whether you have a 'state of the art' composter, or a neglected plastic 'Dalek' in the corner of the playground. This handbook supports teachers to use composting as an inspiring teaching resource throughout the school year.

For each month it contains a curriculum-linked KS2 lesson plan and an Eco Team activity, plus a wealth of supporting documents to bring composting to life for adults and pupils.

Devon teachers can download it for free from zone.recycledevon.org/composting

There are videos aimed at KS1 and KS2 on this website, as well as an interactive online compost game.



Troubleshoot your compost

Composting raw food waste using a HotBox, Pallet bin or New Zealand box



Dry compost may be full of fungal spores, so water well, ideally with rainwater. Then leave or remix with fresh green materials.
Add fewer dry materials.
Water before you dig out.



Composter - Add more dry, carbon rich materials such as wood chip/sawdust/cardboard.
Ideally, the compost should be dug out and layered compost, carbon source, compost etc. However, adding a good layer of dry carbon rich material on top will help.



Caddies – don't leave collected food waste to fester in caddies; empty them on a daily basis and regularly wash them out.



Composter - Fruit waste can attract flies. Rake food waste flat and cover with a carbon source (sawdust/wood chip/newspaper).

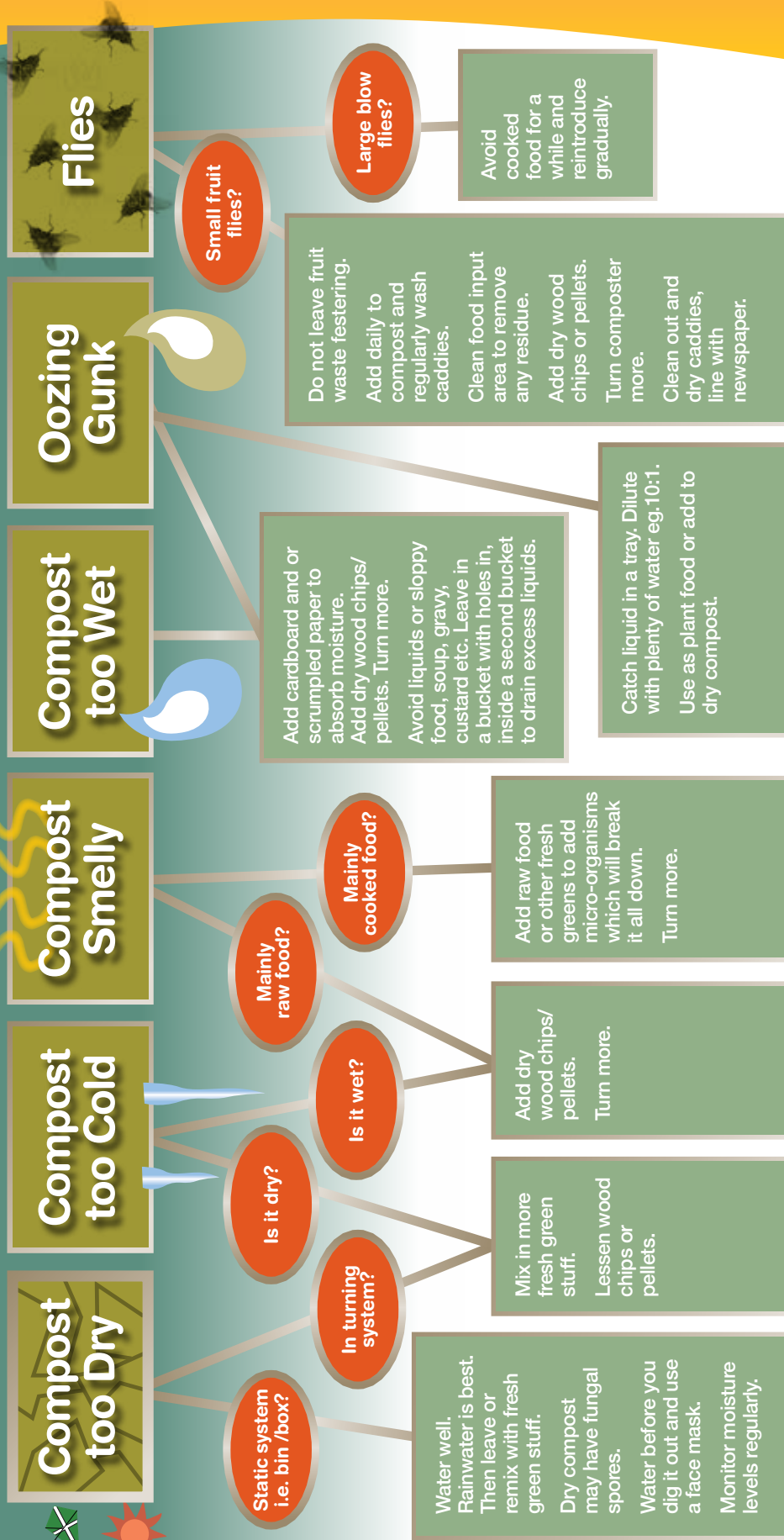


Remember the Compost Mantra: Food - Water - Air - Warmth



Troubleshoot your compost

Composting cooked food using a turning system



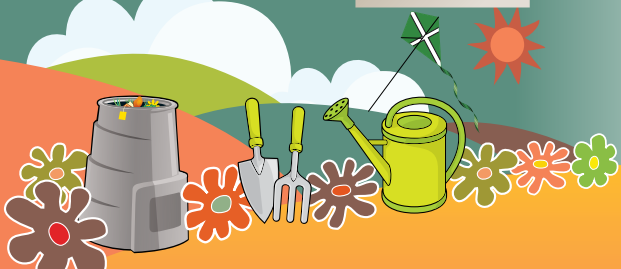
Remember the Compost Mantra: Food - Water - Air - Warmth



Devon Community
Composting Network

www.dccn.org.uk

www.zone.recycledevon.org



Resources – 5 day food waste audit sheet

School name:

Number of pupils on roll:



Please fill in white boxes only

mass (kg)

| Category | Monday | Tuesday | Wednesday | Thursday | Friday | Total | Average |
|---------------------|--------|---------|-----------|----------|--------|-------|---------|
| Fruit snack waste | | | | | | | |
| Uncooked food waste | | | | | | | |
| Cooked food waste | | | | | | | |
| Total | | | | | | | |

| | |
|--------------------------------|--|
| Weekly total food waste | |
| Approx yearly total food waste | |
| Weekly food waste kg per pupil | |



Resources – Risk assessment template

To download this template as a Word document so you can edit it to suit your school's needs go to

zone.recycledevon.org/sites/default/files/Risk_Assessment_for_composting_activities_in_schools7.docx

Small portion of template shown for illustration purposes only

| Hazard | Likely injuries or problems | Procedures already in place | Risk rating = Hazard severity x likelihood of occurrence (1 nil-5 high) | Further Mitigation | Residual risk rating |
|------------------------|---|---|---|---|--|
| Location of composters | Contravening Animal By Products Regulations. Spreading of disease though animals. | 1. Pigs not allowed on premises if composting of food waste is taking place. 2. Preferable that chickens are not on premises. | 1. 4x1=4 2. 4x3=12 | 2. If there are chickens on site, they must be in a securely fenced off area and not have access to the compost. If there is any spillage of food or compost this needs to be effectively cleaned up. Notice about site hygiene to be put on the side of the equipment. This is important as the presence of decaying waste food will attract birds and vermin. | 2. 4x2=8 |
| Assembly of composters | 1. Fingers trapped/banged/cut 2. Injury from handling heavy components | 1a. Following the manufacturers' instructions 1b. Using appropriate tools 1c. Wearing gloves 2. Following good manual handling practice | 1. 2x2=4 2. 2x2=4 | 1. Children only to take part at adult's discretion and under one to one supervision 2. Children only to take part at adult's discretion and under one to one supervision | None to children 1x2=2 adults None to children 1x2=2 adults |
| Collecting food waste | 1. Injury from handling heavy containers 2. Spillage of food waste 3. Injury from handling sharp objects | 1a. Containers not to be overfilled 1b. Good manual handling procedures to be used 2a. Containers to be used daily 2b. Containers to be used as necessary 3a. Food and waste to be used in the same order as they are collected 3b. Containers to be used in the same order as they are collected 3c. Containers to be used in the same order as they are collected | 1. 2x2=4 2. 2x2=4 3. 2x2=4 | 1. Age limit for children to help at adults' discretion. Possibly choose special monitors. Children to collect and carry. | 1. None to smaller children 1x2=2 others |
| Using composters | 1. Fingers trapped/banged/cut 2. Injury from lifting heavy containers to transfer food into composters and from turning compost 3. Food waste on hands 4. Flies/maggots 5. Bio aerosols – breathing difficulties leading to death 6. Bio aerosols – breathing difficulties | 1a. Using appropriate tools 1b. Using appropriate tools 1c. Wear gloves (and wash after use) 2a. Containers not to be overfilled 2b. Good manual handling procedures 3a. Wear gloves (and wash after use) 3b. Good hand washing procedures 4. Follow manufacturers' and advisors' instructions and advice on mix quantities 5. Immuno-compromised children and adults (e.g., no spleen, recovering from chemo-therapy) should not take part in composting activities 6. Children/adults with respiratory issues - consider whether individual participates in composting activities; watch for any reaction (e.g., coughing, wheezing, sneezing) | 1. 2x2=4 2. 2x2=4 3. 2x2=4 4. 2x3=6 5. 5x1=5 6. 2x2=4 | 1. Adults only to turn and lift 4a. Contact experts for advice 4b. Provide locks for 1 st stage containers if appropriate Reassess after 6-12 months | 1. 2x2=4 1. None to children. 4. 2x2=4 |
| Turning compost | 1. Injury from lifting heavy containers to transfer food into composters and from turning compost 2. Injury from lifting heavy containers to transfer food into composters and from turning compost 3. Injury from lifting heavy containers to transfer food into composters and from turning compost | 1a. Ensure composters not overfilled 1b. Understand process including retention time in compost – see guidelines/instructions 2. Regular turning of waste (and wash after use) | 1. 4x 2=8 | 1a. If too much waste, extra waste will have to go in dustbin for collection. Do not spread uncomposted food waste onto school gardens. | 1. 4x 2=8 |

SAMPLE



Useful websites, books & videos

Useful websites

zone.recycledevon.org/teachers

Teaching resources and other information about waste, recycling and composting in Devon

www.dccn.org.uk

Devon Community Compost Network - school and community composting

www.foodforlife.org.uk

Transform food culture within your school.

www.countrysideclassroom.org.uk

Connecting schools with food, farming and the natural environment

www.childrensfoodtrust.org.uk/

www.recycledevon.org/map

Devon map showing locations of recycling centres

Books

For adults

'How to make and use compost; the ultimate guide'

by Nicky Scott, ISBN 978-1900322591

'Organic Gardening – the no dig way'

by Charles Dowding, ISBN 978-0857840899

For children

'Food waste'

by Deborah Chancellor, ISBN 978-0750257114

'Compost Stew'

by Mary McKenna Siddals, age 4-7 ISBN 978-1582463162

'Compost: A family guide to making soil from scraps'

by Ben Raskin, ISBN 978-1782400486

Videos

Minibeasts in the Compost heap, Sing along to the Compost Song and Plants love Compost

zone.recycledevon.org/videos/compost

Using a Dalek composter YouTube videos:

1 – How to compost at home using a plastic Dalek

2 – How to rectify a Dalek composter when it has gone wrong

3 – Top tips for maintaining your Dalek composter

4 – More top tips to maintain your Dalek composter



Contacts in Devon

Contacts in Devon

Devon Community Compost Network (DCCN) – composting information for schools and community groups www.dccn.org.uk

Nicky Scott (Coordinator of DCCN)
nicky.scott@devon.gov.uk 07919 467589

Melissa Harvey (DCCN Education Assistant)
melissaharvey.dccn@gmail.com 07732 396012

Devon schools can book Waste Audits, Assemblies and Recycling/ Composting workshops and Recycling Centre and Energy from Waste plant site visits. Contact: Heidi Diepold, Waste Education Officer, Devon County Council, 01392 383000 recycle@devon.gov.uk

Local Authorities:

For advice on how to set up/improve a recycling collection in your school contact your local council:

East Devon: 01395 516551

Exeter: 01392 277888

Mid Devon: 01884 255255

North Devon: 01271 374776

Plymouth: 01752 668000

South Hams: 01803 861234

Teignbridge: 01626 361101

Torbay: 01803 201201

Torridge: 01237 428700

West Devon: 01822 813600

Devon County Council: 0845 155 1015 or 0345 155 1015





Contact details to go here?