Leaf mould

- Is a form of compost where the breakdown of the lignin in leaves is done by fungi rather than bacteria which is why leaves are best dealt with separately from other plant material.
- You can still add some leaves to your normal compost heap as a "brown"
- It is a slower process taking at least 1 year, maybe 3
- While not high in nutrient content, leaf mould is an excellent bulky and fibrous soil conditioner
- When ready it is rich dark brown, soft & crumbly, with no recognisable leaves and has a smell reminiscent of ancient woodland.
- Avoid leaves from roadsides
- Increase the speed of decomposition by running over leaves with the lawn mower to chop them up

2 ways to make leafmould

1. the black bag method
2. the compound method

1. The black bag method :-
Fill black sacks 2/3 full of damp/ wet leaves, tie a knot in the bag, punch a few holes in the sides, give the bag a shake and leave somewhere out of sight for at least a year. This is a good method where the quantity of leaves collected is small or erratic.

2. The compound method :-
Make a simple compound out of posts driven into the ground and a surround of chicken wire mesh. A metre square is a good size. If you wish line the sides with cardboard or black plastic. Fill the compound with leaves, which should be moist, and push down if necessary. Cover with carpet or cardboard & leave for at least a year.

Uses

- Leafmould makes an excellent soil conditioner especially on heavy clay soils
- Mix with sharp sand to use as an autumn top-dressing for lawns
- 1yo leaf mould can be used as a mulch on beds
- 2yo leafmould can be mixed with equal parts of sharp sand and garden compost for a seed sowing mix.
- 2yo leafmould can be mixed with equal parts of well rotted leafmould, sharp sand, garden soil and compost for a potting compost

Wormeries

Worm composting, or vermicomposting, is 'the process of using earthworms to break down kitchen and garden waste, to create faster than normal composting and worm-cast compost.

- Compared to ordinary soil, the earthworm castings (the material produced from the digestive tracts of worms) contain five times more nitrogen, seven times more phosphorus and 11 times more potassium. They are rich in humic acids and improve the structure of the soil' (Ref: www.wikipedia.org, Jan. 2006).
- Worms have evolved into efficient, natural composters; they never sleep so are producing compost all the time. In the right environment, they eat and digest between half and all of their body weight in a day quickly reducing the bulk of the organic waste, by up to about 80%.

What is a wormery?

A wormery is an easy-to-use, efficient construction to house the worms and their food so that they can convert organic kitchen waste into a bio-rich, high quality compost and concentrated liquid feed.

- Typically, a wormery is an enclosed unit with several separate, but linked, compartments containing live worms together with the organic waste you supply, and a mixture of processed compost in varying stages of decomposition.
- Most wormeries should provide a large surface are compared to volume – often stacking trays
- The uppermost compartment can be topped with a simple, degradable blanket to retain the warmth and it should be kept moist. This can be fibre matting, old fibre carpet underfelt (not the latex type), old towels, newspapers or similar. The enclosure is completed with a lid perforated with small breathing holes.
- Most purchased wormeries have a sump and drainage tap. If not they must have sufficient deep bedding & drainage direct to the earth
- Wormeries are best sited outside in a protected position, frost free, not in direct sunlight and protected from heavy rain.
- They are ideal for small households & small spaces
- Kids find them fascinating
- They are suitable for some cooked foods as well as usual vegetable waste
- There are some made specifically for use with dog faeces
- You can make your own wormery or chose to purchase from a variety of styles made in wood or plastic. The latter come with instructions for that particular model.
- Usually supplied with suitable composting worms such as *Eisenia Hortensi, Eisenia Foetida* and *Dendrobeaena Veneta*.
- Keep keen fisher-men away!
- Use of Rock dust helps the worms digest organic matter & helps regulate pH
- Addition of garden lime can be helpful
- Worms have no teeth, so chop up food small, even process in a food processor!
- Extracting worm cast compost can be a bit tricky with some models

<u>Common Problems</u>

- Mixture too wet – check the sump is empty, add more loo-roll-tube type cardboard.
- Smelly – too much food waste added at one time compared to the number of worms. Allow the wormery to establish with small but frequent feeding. Chop up food waste more. Check the "No thanks list"
- Fruit flies can be a nuisance, but not a problem to the worms
- Tiny white worms enchytraeids are often seen are are an indication of acidity; add some lime
- Ants – indicate the wormery is too dry. Moisten the food waste. Smear Vaseline on the legs of the wormery if it has them
- Centipedes & slugs should be picked out if possible as they can be harmful. Ensure the lid is on correctly
- Seeds are not always destroyed

<u>Using Worm Compost</u>

- Worm Compost is "strong" and does not need to be used in great quantities; "less is more" when adding to vegetable plot or herbaceous borders.
- Not recommended for ericaceous plants if lime has been used
- Worm compost can used to make a "tea"
- Liquid from a wormery can be diluted with water to make a liquid plant food – usually 1:10
- Liquid from a wormery can be added to the compost heap as an activator

Bokashi

In composting this is a term used for an fermentation process, usually anaerobic, which produces waste that readily decomposes fully and quickly when buried in soil or a compost heap. Bokashi is a trademark /brand name.

- The usual Bokashi system uses 2 tighly sealed buckets, used in succession – one in use- one resting.
- The Bokashi bucket has a sump, tap and a tight fitting lid, plus float-like tool to compress the bin contents.
- It is suitable for indoor use, working well at usual room temperatures.
- Simple to use, but requires access to a garden or compost heap (not wormeries!)
- It is suitable for disposal of kitchen food waste such as meat, fish, bones, dairy products and fatty foods.
- A starter culture of EM – Effective Micro-organisms, which include lactic acid bacteria, phototrophic bacteria and yeasts, are mixed with a substrate such as wheat or rice bran and molasses. This is put in the base of the bucket and strewn over each successive layer of kitchen scraps added. This is repeated until the bucket is full. At this point you let it sit undisturbed for a couple of weeks or more and start the next bin.
- When the resting period is over, the Bokashi bucket contents can be buried in soil or added to the compost heap. Allow 2 weeks before planting into this area.
- The acid nature of the Bokashi "compost" makes it unattractive to vermin, cats & foxes.
- The Bokashi liquid from the sump can be diluted with water and used as a liquid plant feed, minimum of 1part Bokashi to 100 parts water.
- Undiluted the Bokashi liquid is a good drain cleaner - it is highly acidic!
- You need to keep buying starter bran or buy an EM maker…….check each batch of bran is vacuum sealed properly & no sign of blue/ green mould.
- On arrival check your bin(s) is watertight after fitting the tap.

- EM cultures are claimed to have wider uses & benefits including household cleaning, reducing harmful bacteria, enhancing soil health

Food digester/ Green Cone

- Aerobic food digestion system
- Takes all household food waste, including vegetable scraps, raw and cooked meat or fish, bones, dairy products and other organic kitchen waste, but not grass & garden waste such as weeds & prunings.
- The Green Cone is a four-part moulded plastic unit comprising a lower basket installed below ground and an upper cone above ground.
- The patented design of the unit utilises a solar heating effect between the inner and outer upper cones to promote air circulation, this facilitates the growth of beneficial micro-organisms and the aerobic digestion process.
- An initial inoculation of microbes is supplied/ required & needs an occasional top up
- The household food waste is converted into water, carbon dioxide and small amount of residue that will only need to be removed every few years in a well operating Green Cone.
- Very simple to use
- Vermin proof

It doesn't make compost, but does deal with a wide variety of food waste

Stews

Certain plants – usually weeds can be stewed in water to produce a useful liquid / foliar plant food
All require the leaves and/ or stems of the plant, water and a bucket with a tight fitting lid.
The resulting "tea" is diluted at least 1:10 or to the colour of weak tea.

For Example :-

Comfrey	High in potassium + trace elements
Nettles	High in nitrogen + trace elements
Garlic	Sulphurous, antimicrobial & anti fungal properties. Especially good if combined with chilli against aphids
Perennial weeds	Many extract trace elements & other nutrient from deep in the soil. Drowning is a way to make safe for the compost heap
Rhubarb	Oxalic acid is poisonous; useful for aphids
Sheep poo & Worm cast	High nitrogen/potassium feed

Fast Composters & Tumblers

- All work on the principle of increased aeration, through design and /or the tumbling process
- All ensure adequate insulation and retention of heat generated within
- Usually expensive
- Some easier to use than others; require space to manouvre & sunny position
- Versatile
- Reduced labour
- Fast turnaround – as little as a month

Magic mound

- A good way of dealing with woody garden waste such as prunings, brassicas stems, brambles
- Starting with a grassed area, turf and dig a circular hole 1' deep and 5' wide, or a 5' long trench. Dig another hole 1'deep in the centre and pile the woody waste into this, subsoil can be added to fill gaps. Pile the turves back on top of the woody waste, face down. Top this in turn with, well rotted leaves, half rotted compost & finally soil from the digging compost. Don't bank too steeply – soil will wash away.
- The layers gradually break down, slowly releasing nutrients and creating a rich humus over a 4-5 year period.
- Can convert to a raised bed
- Grow nitrogen fixing crops in the first year, then hungry crops such as courgettes or strawberries, trees & fruit bushes

Woody heap

- Another way of composting large quantities of felled trees & woody waste
- Using the suitable lengths of tree trunk as posts create a compound. The wall supports are rammed into the ground, alternating in a double row. The next smallest branches are cut to length any laid between the posts, working round all 4 sides to form walls of branches, compacting as you go. When the compound is complete start filling the centre with more branches, twigs, leaves and soil to hand. Some manure or grass can also be added. Compact the contents from time to time & water well.
- This is a long term heap taking a minimum or 2 ½ years to breakdown
- The end product makes an excellent mulch
- Excellent wildlife habitat

Grass boarding

Many householders find that their garden waste is restricted to grass cuttings and that it is difficult to properly balance this with other materials. One option is 'grass-boarding' where thin layers of grass are layered between torn up cardboard. The result can be excellent compost, which is weed-free and does not contain large particles or lumps of material.

Sheet composting

- Sheet mulching is a no-dig gardening technique
- It starts with a grassed or weedy area, which should be relatively flat & tall stems should be cut down. The ground is given a dressing of "activator" such as manure or pelleted chicken manure, possibly lime as well. The area is then covered by a mulch of thick cardboard or newspaper which acts as a weed suppressant. It is a good idea to wet the cardboard or paper. Top with a *minimum* of 15cm weed-free material. Best is leaf-mould, but bark chips, pine-needles, POD compost can be used. The layer can include weed-free soil directly on top of the cardboard if immediate planting is wanted.
- Trees and shrubs are best planted first & worked round
- Smaller plants can be planted through the cardboard
- Sheet composting as a term is also sometimes applied to large scale operations where a thin layer of green manure or similar organic matter is ploughed or dug into the soil, often in autumn.

Industrial & Communal

Large scale composting by local authorities or community groups is increasing, especially in an effort to reduce landfill waste. The costs of producing such compost are usually easily covered by the sale of such material.
Quality can be assured by looking for BSI PAS100 certification & ISO 1400 1

BSI PAS 100 is a quality assurance covering the quality of input materials, absence of pathogens and weed seeds, strict limits on potentially toxic elements and grading of particle size. Plant growth tests are also carried out (80% compared to peat controls)

ISO 14001 was first published in 1996 and specifies the actual requirements for an environmental management system. It applies to those environmental aspects which the organization has control and over which it can be expected to have an influence.

Some Scottish examples are

- HotRot at Blochairn Wholesale Fruit & Vegetable Market where discarded fruit, vegetables, waste wood and cardboard are turned into compost
- Edinburgh Community Backgreens Community took delivery of eight, **Rocket A500** in vessel composters for a pioneering city centre based tenement housing project in 2007
- Deerdykes Composting and Organics Recycling Facility, Cumbernauld coverts the contents of brown bins into POD soil conditioner

Open windrow composting is used for processing garden waste, such as grass cuttings, pruning and leaves in either an open air environment or within large covered areas where the material can break down in the presence of oxygen. Food and animal wastes cannot be accepted at such sites

Community composting is particularly useful in rural areas where municipal facilities are poor. Often run as a community business linked to wider re-cycling activities, providing local jobs, and a valuable local service. Some facilites incorporate shops & cafes.

Got compost – now what?

- Work into your veg beds for healthier vegetables up to about 1 wheel-barrow full per 5m2 every year.
- Work into your flower beds; a 10cm layer dug in before new planting, or a 5cm mulch around existing plants.
- Mulch around trees (including fruit trees & shrubs); "rough compost" can be used in this way.
- Replenishing pots & containers – either at re-potting or as a top dressing.
- Make Compost "tea". Soak a bag of compost in water to make a liquid plant feed – dilute before using.

Feed Lawns; sieve & mix with an equal amount of sharp sand & spread up to 2.5cm thick, brush in

Health & Safety

- Keep cuts and any broken skin covered
- After handling any compost or waste materials wash hands well with soap and running water.
- Keep people with breathing or immune deficiency problems away from the compost heap when it is being turned. Fungal spores are released which may cause a reaction in susceptible people.
- Keep anti-tetanus protection up-to-date.
- Limit contents of the compost heap to materials of plant origin only.
- Use manure from vegetarian pets (rabbits, guinea pigs) only. Avoid cat and dog manure. They can contain pathogens that are harmful to humans.

Useful Web addresses

Compost general http://en.wikipedia.org/wiki/Compost

compost images - google images

good science/biology
http://www.informaworld.com/smpp/section?content=a794968667&fulltext=713240928#references

http://www.wormeries.org.uk/

http://www.wormresearchcentre.co.uk

http://organicgrowersfairlie.co.uk/Vermiculture.php

http://www.originalorganics.co.uk

http://www.bucketofworms.co.uk/wormery.html

http://www.compostworms.co.uk

http://www.askorganic.co.uk/composting/Worms%20&%20Wormeries.htm