Making Compost:

Compost is the biggest single item that leads to success in organic gardening. It helps the plants and soil in so many ways that it outshines anything else. If you truly want to succeed at growing food, you really ought to try your own compost pile, the bigger, the better. At first if you need to buy some good compost to start out, that's fine, but keep eying a space near the garden for your compost pile and keep the information in this section in mind for when you build one, or two.

For any compost pile, what you're trying to do is contain the pile and allow for enough air and moisture to support the bacterial growth inside the pile. With combinations of the right materials, the compost will break down over a few months and provide fertile amendments for your garden that help plants thrive. Organic compost is one of the best baseline soil amendments that can help sustain a healthy **soil food web** that leads to successful vegetable gardening. I really can't overstate this.

Benefits of compost:
Provides nutrition for plants
Improves soil structure
Enhances moisture retention in soil
Helps prevent plant disease
Moderates soil pH
Feeds soil organisms
Enhances aeration of soil

Carbon and Nitrogen
You'll be adding organic materials to the pile from two main groups: Carbon-rich materials and Nitrogen rich materials although most materials have some carbon and some nitrogen.

The carbon, or 'brown' materials are dry, mature things like leaves, straw, and old stalky plant cuttings from the garden. They have higher percentage of carbon than nitrogen in their makeup. Nitrogen or 'green' materials are immature plant materials like veggie scraps from the kitchen, fresh grass cuttings, or any fresh green plant materials. These contain a higher proportion of nitrogen and lower proportion of carbon. The nitrogen-rich materials tend to contain more water as well, much like freshly cut grass is a wetter material than aged straw or dried leaves.

Aerobic vs Anaerobic
We're trying to get an Aerobic compost pile. This produces the 'healthy' bacteria that break down the material in the pile quickly and without odors. This process requires lots of oxygen. You've probably experienced the foul odor of Anaerobic

composting when you opened a plastic container of some food that was past its prime (in an environment of low oxygen). This type of bacterial activity has the tell tale 'slimy' consistency and a signature smell that is particularly offensive. It also tends to attract more pests. The way to avoid the anaerobic activity is to maintain enough oxygen flow in the pile.

The 'Hot' compost pile:
What you should try to attain in a hot compost pile is the healthy **aerobic** breakdown of the materials. When the pile is layered with the correct proportion of carbon and nitrogen the temperature of the pile heats up to above 130 degrees. This is a byproduct of all the bacterial populations digesting the plant material. This is called **'thermophilic'** decomposition and it's what turns plant matter quickly into perfect compost to re-invigorate your soil. The higher temperatures generated by thermophilic piles also help to destroy pathogens, and weed seeds in the pile, and accelerate compost to about a three month process.

The optimal C/N ratio for aerobic compost is 25-30 parts carbon to 1 part nitrogen by weight (30:1). This proportion is a balance between speed and preservation of the nitrogen material in the pile. All compost is not equal. If you have too low a proportion of carbon in the pile, it can heat up quickly, but a higher percentage of the nitrogen will be depleted by the time the pile is mature, leaving a lesser compost for the garden.

If the C/N ratio is too high, like 50:1 for example, this process can take as long as two or three years since the pile will stay close to ambient temperature and have low bacterial activity. This type of cool compost is operating in what's called the "**mesophilic**" stage. This is common in piles that people haphazardly leave in the back yard. They come out a year later and it is much as it was when they left it. With just a little attention to proportions, containment, and a bit of water, this can heat up again and turn into great compost for the garden.

Now it can be a bit confusing at first to understand the C/N ratio. Every material has some carbon in its make up. Some materials have more carbon than others. So if you're adding about 50 pounds of freshly cut grass, you can add 25 pounds of dried leaves. Which seems reversed, but actually the grass has a C/N ratio of about 17:1, whereas the leaves have a C/N ratio of about 70:1 This particular ratio ends up being about 35:1 when mixed. Which is just about right. (maybe a bit high in carbon) *see chart on C/N ratios of common materials below. Many people find it easier to just layer about twice as much dry, 'brown', or dry carbon material as the wet 'green' material while layering the pile. So it may be a five inch layer of dry leaves followed by a one inch layer of veggie scraps or fresh grass clippings, and so on.

Every pile is a bit different. Just try layering one to start using the basic steps

below. If you have a compost thermometer, you can track its progress and get an idea of how well the pile is doing.

Building the Basic Thermophilic Compost pile:

To start:
-Mark out the area where you want to make the compost pile. It should be at least a 12 square foot area. Three feet by four feet or four feet on both sides is a good starting point.

-Create a boundary using anything from straw bales, wood pallets, boards, or wire mesh. The eventual height of the pile should be about three to four feet.
The containment materials are more a question of aesthetics than function. As long as there is enough air circulation, almost any materials will work for making the bin. You can fashion your own if you're the creative type, or you can choose from many ready-made bins from catalogs or your local nursery. I would steer away from the black plastic bins for now, as they have problems of their own. Your money is more effectively spent on a simple wire enclosure, or some old redwood for building a long term bin.

The Steps:
-Loosen the native soil beneath the pile location with a garden fork to about 12 inches below the surface. This will help with drainage.
-Place some brushy material at the base of the pile first for about a three inch layer. This will help provide some air circulation from the bottom.
-next, put down a three inch layer of dry (mature) material, weeds, leaves, straw or grass clippings.
-Water that layer thoroughly.
-Add a one to two inch green material layer of (immature) material like kitchen veggie scraps, fresh weeds, fresh grass clippings or other nitrogen materials.
-Water that layer thoroughly.
-Cover that layer with a thin layer of soil (1/4 inch) to keep down bugs and add a microbial boost to the pile. This soil layer can be alternated every few layers.
-Water that layer.
-Continue this process of layering dry/mature elements (carbon) with wet, immature (nitrogen) elements along with thin layers of soil, making sure to water each layer.
-You can add a higher proportion of carbon then nitrogen materials to the pile, which is typically the case as far as what is available. A thick layer of brown followed by a thin layer of green.
-Make sure that when you place your layers, you utilize the full space within the perimeters of the bin. Layer it from wall to wall.
-Once the pile gets three or four feet high and you want to top it off to let it compost, just add an inch of soil or five inches of leaves to cover it.

-Water the pile as needed to keep it the consistency of a wrung-out sponge
-Cover the pile with a piece of cloth, burlap or other material, as well as a rain proof covering on the top of pile to keep it from being soaked in the rain. A piece of pro-panel roofing or a piece of plywood will work fine.
-Let the completed pile cure for three to six months while you build other compost piles.
-To speed up the process, monitor the temperature with a compost thermometer and after its first heat/cooling cycle when the temperature drops down quickly, (usually at about three to four weeks) turn the pile and re-water it. Then let sit and it will heat up again.
-A four-foot pile completely composted will drop to about two feet high when ready.
-Finished compost should be dark and crumbly like cake. It should not smell bad. It should smell like forest soil in the spring. You shouldn't be able to tell the original material, and it should be sifted through hardware screen to remove un-composted materials that should then be returned to the bottom of the next pile.

Best materials to make compost piles and how to get them:

'Brown' Carbon materials:

-**Leaves** (shredded is best, if not, try to mix with other browns to avoid matting)
-**If you have your own**, rake em and use em.

One of the greatest sources of leaves is from other people's yards.
Two ways to acquire copious amounts of leaves are as follows:

-**Drive around town** in the autumn when everyone is raking and bagging their leaves and pick up the bags along the curb with your vehicle. Some towns even have designated dates where the city will pick up leave bags in the fall. Go around the day before and haul as many as you like.
-**Call around to landscaping companies**. Many of them have to pay to dump leaves during the fall and would love to have a place to Deliver them. (your house) That way you don't even have to go to town. The leaves can be deposited in your yard for you to compost at will.

-**Straw** *Be very careful sourcing straw and hay. See the pesticide carryover section on the website. If you can find a source with no chemical spray residue, go for it. Straw is a great compost material. In fact, it's many people's favorite material. Just find a trustworthy source.

-Hay Tends to have more weed and grass seed in it. (straw is better)
-Wood chips (very high in carbon. Use sparingly in any compost pile)
-Sawdust (same caution, and tends to mat in the pile, blocking oxygen)

-Shredded newspaper
-Corn stalks (dry)
-Pea/Bean vines (dry)

<u>'Green' Nitrogen Materials:</u>

-**Lawn clippings** (in thin layers to avoid matting)
-If you cut your own lawn and know that there are no chemicals added to it, then by all means compost all the grass you like. It is one of the best nitrogen layers for compost piles out there. If, however, you are getting the grass clippings from elsewhere, be very careful you are not getting it from a homeowner or business that has added chemicals, pesticides, or herbicides to their lawn, because they will now be in your compost, and eventually in your garden. Don't be the vector that brings unwanted chemicals into your great organic food garden!

-Garden scraps: collect any time you harvest from the garden. All uneaten plant material goes into compost, or a worm bin if you have one.
- Veggie trimmings/compost from **Organic Grocery Stores**: Many organic grocers generate full garbage bags of veggie trimmings every day. If you check in with your local store you can usually get garbage bag loads of fresh material to start a compost pile/worm bin, or add to an existing one. When I'm starting a new pile but don't have enough greens around, I make several trips to the organic grocery store during a week and stage them to build the pile at the end of the week. I can easily get a hundred pounds or so and it's free!
-Any vegetable/bread/grain scraps from kitchen
-Seaweed
-Cow manure: Use sparingly to avoid burning plants. Add in fall and compost at least three months in active pile.
-Chicken manure: Use very sparingly, very 'hot' with nitrogen, make sure to add in fall and compost at least three months in active pile.
-Eggshells (crushed)
-Cover crops
-Flowers
-Apple pulp from apple cider pressings

-Coffee grounds: Start a relationship with your local coffee shop. They throw out used coffee grounds every day. They are a great source of nitrogen for compost piles and worm bins and are free for the taking. If you want a consistent supply, many of the shops will let you drop off a small plastic garbage can with your name and phone number on it so they can just put coffee grounds in it and you can come pick it up when it's full.

Materials to avoid:
-pet manures from cats or dogs

-pine needles (too acidic) unless you are making special compost to lower the pH of alkaline soils. They also take quite a while to break down.
-Leaves from trees that have elements *toxic* to other plants: Eucalyptus, California bay laurel, walnut, juniper and cypress.
-weed material that is in full seed.
-plants infected with disease or severe insect attack or eggs.
-poisonous plants like hemlock or castor beans.
-Any type of meat, dairy, or oily substances. They technically CAN be composted, but it's a bit more advanced and requires a tighter control on temperature to break down properly.

Carbon to Nitrogen ratios of common composting materials.

Material	C/N
Grass Clippings	17/1
Chicken Manure	7/1
Food scraps	17/1
Vegetable scraps	12/1
Cow manure	20/1
Fruit waste	32/1
Fresh weeds	20/1
Seaweed	19/1
Garden soil	10/1
Hay	90/1
Leaves	70/1
Sawdust	325/1
Wood chips	400/1
Peat moss	58/1
Corn stalks	60/1
Shredded Newsprint	175/1
Shrub trimmings	53/1

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