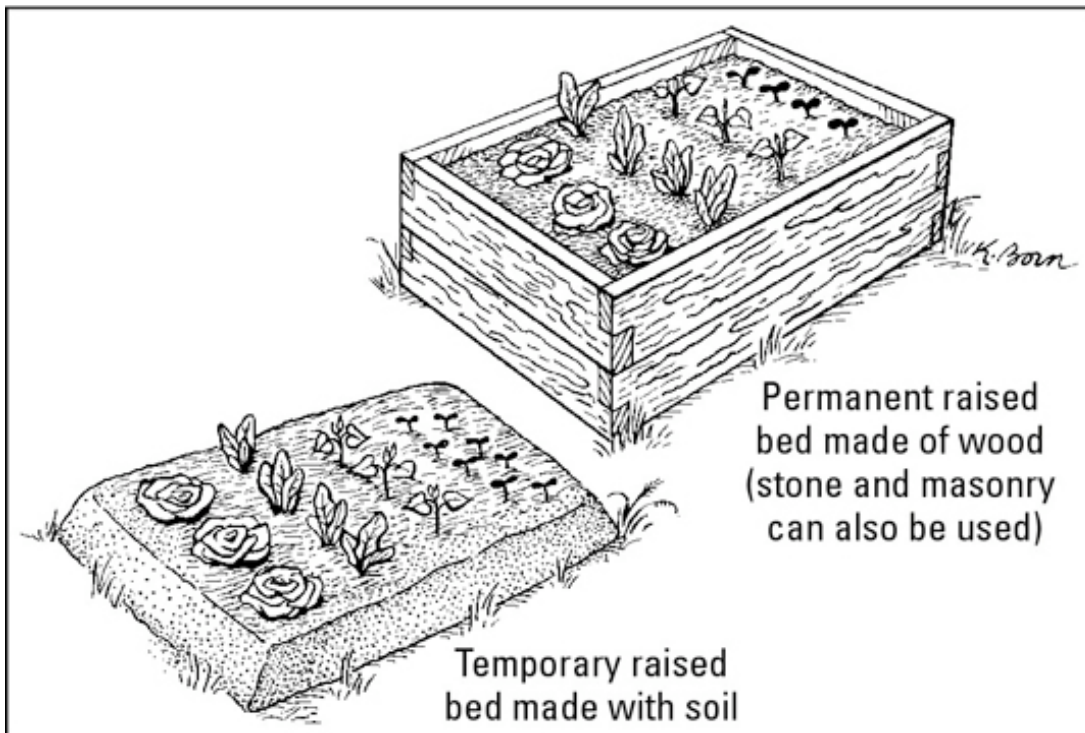


The Food Project's Do-It-Yourself Raised Bed Building Manual



The Food Project wants to make it easy for others to build their own raised beds. We hope you find the information in this manual useful for your current and future gardening projects. This manual includes:

- Step-by-step instructions for how to build one type of raised bed
- The Food Project's experiences and ideas for sourcing materials
- Guidance for people interested in growing food in raised beds

WHY GROW FOOD IN RAISED BEDS?

The Food Project began promoting raised bed gardening as a solution to growing in contaminated soil, and quickly learned that raised beds provided many more benefits!

- More control over soil type and condition
- Get started sooner because soil warms up faster
- Easy to attach trellis, cold frame, fencing, etc
- Reduced soil compaction (=less work!)
- Easy to use the square foot method, which is:
 - Simple to learn, even for beginner gardeners
 - Increases production by maximizing every inch

CHOOSING THE FRAME

This first step in making your raised bed can range from being easy to intensive based on how creative you would like to be. Depending on **the size of the bed** you would like to make and the **type of materials** you can find, you may have a small, quick project or a long-term endeavor ahead of you!

Frame measurements

Despite what kind of materials you decide to use, we recommend the following measurements for a successful raised bed:

- **4x4-foot box** is the best beginning template because you can
 - Walk around the entire garden
 - Easily reach into the garden from all side to tend your plants
 - Avoid stepping on growing soiling



4x4-foot raised beds

- **If you have more space**, you can add length to this frame while keeping the 4-foot width to enjoy the same perks listed above. TFP's raised beds are generally **4x8-feet**. This requires **3 pieces of 2"x10"x8' wood**; one of these pieces is cut in half to make two 4-foot long sides (the short sides).

TIP: Your bed's measurements will also be determined by the **location** of your bed. Before deciding what kind of raised bed to make, find the right place for the raised bed in your front or back yard. You will need enough **sunlight** for the plants to grow and **space** for yourself to get around the bed easily for maintaining the garden.

Types of materials

WOOD



- **Untreated pine** is the type of wood we usually use because it is affordable and has lasted between 3 and 7 years. **Price: \$8 per 2"x10"x8' piece**
- **Spruce** is a nicer type of pine that will cost a bit more. **Price: \$9 per 2"x10"x8'**
- **Redwood** has natural rot- and insect-resistant properties, but more easily found on the West Coast of the US and thus much more expensive. **Price: \$6/ft, only 1" thick**
- **Cedar** is also naturally resistant to insects and rot and will last a *very* long time, but it is also *very* expensive. **Price: \$4 per 1"x4"x6' piece; \$9 per 1"x6"x9' piece; \$6/ft**

- **Composite wood** is a product made from recycled plastic and wood fibers – like sawdust from woodworking shops and used plastic grocer bags – and it comes in a variety of looks. This material is even more expensive because it is extremely long-lasting and water-resistant. **Price: \$16 per 4 ft; found online here:** <http://eartheasy.com/wood-grain-composite-timber-4-feet-long>

TIP: Never use pressure-treated wood because the chemicals can potentially seep into your garden.

CINDER BLOCKS, BRICKS, STONES



- You may have to go on a classified ads hunt or search around your neighborhood, but if you are lucky you can get these materials for free or close to nothing.
- Some are more aesthetically pleasing than others, but it depends on what you like.

TIP: The cinder blocks add more space to your bed; the holes can be used for planting herbs, flowers, or vegetables.

STRAW BALES



- This is a very unique way to set up a raised bed garden, because the bale is the garden.
- The recommended straw bales for a garden are: **wheat, oats, rye, or barley straw**.
- These are less common because they often have other weeds and grass seeds that can cause trouble.

TIP: If this is your garden of choice, go to your nearest farm to purchase straw bales (up to \$10 per bale).

PLASTIC BOTTLES, TIRES, OTHER RECYCLABLES Get creative!



- You can reuse items that would have otherwise been recycled or tossed in the dump for the frame of a raised bed.
- Plastic bottles: Two-liter soda bottles would be the best size to use, but personal sized plastic bottles could also work.
- Tires: These can make a low-budget small garden, if you have any spares lying around or source them from a junkyard. Keep in mind, however, that growing in tires is controversial, as some have questioned whether tires might leach toxins into vegetables.

- Unused vehicles: There are many examples of truck gardens or using abandoned vehicles as raised beds. These projects are simple if you have easy access to an unused vehicle (junk yard, neighbors, friends, family, etc.) since they have a pre-made frame (or frames) for you to make into a garden!

Where to buy materials for your frame:

Home Depot (all wood options and more)
5 Allstate Road, Dorchester, MA 02125
(617) 442-610

Lowes (pine, cedar, composite)
599 Thomas Burgin Parkway, Quincy, MA 02169
(857) 403-2069

DB&S Lumber and Home Improvement Center (spruce, cedar)
11 Gerard Street, Roxbury, MA 02119
(617) 445-9333

New England Building Supply in Boston (spruce)
174 Hampden Street, Boston, MA 02119
(617) 445-5900

Boston Building Resources (variety of materials; composite)
100 Terrace Street, Boston, MA 02120
(617) 442-2262

CHECK LIST BEFORE BUILDING YOUR RAISED BED:

- ✓ Find a **location** for your bed with good **sunlight & space**
- ✓ Record **measurements** for the frame
- ✓ Choose the **type of frame** you want to make
- ✓ Get the main **materials** you will need for the frame

BUILDING THE FRAME

Once you decide what kind of frame you are going to use for your raised bed, you are ready to prepare a space in your front or back yard.

Important tips before building:

- Bare soil around the outside perimeter of the bed should be avoided, especially if you are concerned about contaminated soil. Create **ground cover** around the bed to maintain healthy soil within the bed: **grass, wood chips, crushed stone, or even a thick layer of compost**
- **Leveling the area** with a shovel or rake will make it easier to build the bed frame and help with the aesthetics of the frame
- **Sunlight:** Make sure there is nothing blocking your bed area (such as buildings, trees, etc.) that would cause your garden to not get enough sunlight
- **Decide on desired height of frame.** While TFP generally builds raised beds that are 10" in height, the options are endless. A height of 3 feet reduces bending over, while 6" is high enough for most crops. For a 6" high frame, using the highest quality soil, such as Mel's Mix (below), or an organic fertilizer is recommended due to the reduced availability of nutrients from soil.

How to build the frame

Now it's time to make your raised bed frame! The Food Project makes 4'x8' wooden frames for Build-a-Garden beds, so the following information is based on this method.

MATERIALS

- 3 pieces of 2"x10"x8' wood, 1 piece cut in half into 2"x10"x4' pieces
- Choose your method for attaching corners. The Food Project has mainly used Z-max brackets, and will be switching to

1. Use four 9-inch Staircase Angle Z-max brackets (between \$3-4/each on Amazon.com or Home Depot). You will need forty 1¼ inch drywall screws to attach brackets to wood.



2. Instead of metal brackets, use scrap wood (2"x4" pieces cut into 8 or 9-inch lengths will do just fine). Use 3-inch or longer screws.

3. In lieu of brackets, use 6-inch wood fasteners, such as FastenMaster TimberLok Engineered Wood Fastener. These fasteners go in easily using a 12V drill with a 5/16" nut driver attachment. Use 3 fasteners per corner. Cost: box of 50: \$33.46, bucket of 250 pieces: \$94.86.



- Scissors
- Drill
- 4 ft wide landscaping fabric (about \$20 for 4x50ft package on Amazon.com)
 - **Consider quality:** There are varying qualities of landscape fabric. Heavy-duty ones are best to use but harder to source in small quantities. The Food Project often sells pieces of heavy-duty fabric at its Spring plant sales and events.
 - **Other options:** Thick layers of cardboard (boxes) can also act as a barrier between new and old soil

BUILDING INSTRUCTIONS (with Z-max brackets)

--Two people recommended--

1. Place one bracket on the one of the ends of the 4' long pieces of wood, ensuring bracket is flush with the edge of the wood. Drill 1 ¼ inch drywall screws into each of the 5 holes so the bracket attaches to the wood. Repeat using a 2nd bracket on the other edge of the same piece of wood. There should be 2 brackets on the 4' piece of wood.
2. Repeat step 1 with the 2nd piece of 4' wood and remaining 2 brackets.
3. Lay one of the 8' pieces of wood flat on the ground. Person 1 holds 4' piece flush with the end of the 8' piece, creating an L-shape. Person 2 then drills screws into each of the 5 holes on the bracket to attach wood pieces together.
4. Repeat step 3 with remaining 8' and 4' pieces of wood.
5. You should now have 2 separate L-shapes. Line up the two L's so they create a rectangle. Drill screws into remaining holes of brackets so all sides are together.
6. Place the completed frame in the leveled area you wish to have your raised bed.
7. Place the landscape fabric within the frame to create a barrier between existing groundcover. Ensure that landscape fabric is as flush as possible. It is not necessary to attach the fabric to the frame.
8. Now your frame is ready to be filled with healthy soil!

If using 2x4s instead of brackets:

Align each 2x4 piece of wood onto the ends of the 4-foot boards. Drill about 5 screws into place. Then hold an 8-foot board so its end is flush with the 4 foot board, and insert screws (from the outside of the frame) through the 8-foot board into the 2x4 piece and into the end of the 4-foot board. Pay attention to where screws are lined up to avoid screws running into each other. Repeat until frame is made.

TIP: If building raised beds longer than 8 feet, it's best to install cross braces or cross supports to keep the frame from bulging outward over time.

THE MOST IMPORTANT STEP: THE SOIL

One of the most important steps to creating a productive garden is choosing the right soil. Raised beds provide a unique advantage because the gardener can fully manipulate what type of soil the garden will have. Soil is a key determinant in how much food a garden can grow, so it's worth doing your research and spending a little more upfront, if possible. The better the soil, the more you will be able to maximize space and use every inch of your raised bed!

What type of soil?

Mel Bartholomew, one of the pioneers of square foot gardening, requires a raised bed garden to have a combination of 1/3 compost (of varying sources and types), 1/3 peat moss, and 1/3 vermiculite. For most, vermiculite is hard to find and cost-prohibitive. Based on The Food Project's experience with different types of soil mixes used in raised beds, what follows are our recommendations and suggestions for choosing and maintaining soil in raised bed gardens.

- If cost is not a factor, go with "Mel's Mix:" 1/3 compost, 1/3 peat moss, 1/3 vermiculite. Perlite could be substituted for vermiculite. This soil mix will practically guarantee maximum productivity in the first season (of course, presuming the gardener is planting correctly and watering!)
- Consider a starter mix that can be improved over time. The Food Project uses a compost-loam mix. Often a 50%-50% mix is suggested for a garden. Based on most of the mixes we've used from companies in Greater Boston, we have found that 50-50 mixes can have a large amount of weed seed and often the soil's weight is quite heavy. If available, consider mixes with higher ratios of compost, such as 75% compost- 25% loam or 60-40. Also try asking companies for a sample. Often what your own observations tell you is valid! Don't feel too much pressure here. Regardless of the ratio that you choose, you can build your soil base over time.
- Building up soil: Peat moss is a nice addition to raised bed soil. If it is not added into the mix in year one, peat moss can always be added later. Peat will lighten the weight of soil providing more air for healthy root growth, and helps soil retain water. Once you've added the maximum recommended amount of peat moss, you do not need to continue adding it. All of this applies to vermiculite as well.
- Type of compost: compost can come from many sources - leaves, food scraps, grass clippings, wood, to name a few. It is often difficult or impossible to know the source(s) of a particular compost batch. One useful approach is to source different types of compost for your garden, either over the course of a few

seasons or when initially building your raised bed. Varying compost sources within the soil of your raised bed improves overall quality.

- Always aim to add compost once a year, preferably at the end of a growing season. Doing so maintains soil health and depth.

How much soil?

To find out how much soil you will need to fill your raised bed, you can use a **soil calculator**, such as this one: <http://www.gardeners.com/Soil-Calculator/7558,default,pg.html>

- For a 4x8-foot raised bed with a 10" height, about 1 cubic yard of soil is needed.
- For a 4x8-foot raised bed with a 6" height, using Mel's Mix: about 5 cubic feet each of compost, peat moss, and vermiculite is needed.

Useful Conversions:

- 30 gallons (about the size of standard trash bin) = 4-5 cubic feet of compost
- 3.9 cubic feet compressed bale of peat moss = 8 cubic feet loose
- 1 cubic yard = 27 cubic feet

Where do you get it?

It has always been a challenge for TFP to find high-quality soil for a low price in Boston. Our obstacles have led us to seek out the most reasonable places to go to for compost, soil mixes, and supplemental soil products. These are our recommendations for where to get affordable, accessible soil and how to best get it to your home.

SOIL VENDORS

Rocky Hill Farm

34 Butterfield Road, Saugus, MA

(781) 233-9480

www.rockyhillfarm.net

- **Compost:** \$20 per cubic yard
- This farm does not deliver for such small amounts, so you will need to drive there with your own vehicle or a rental truck. They generally do not deliver to Boston. Ask about the option of DIY pick up via filling barrels, and tell them TFP referred you. They have great product!

Boston Bark Landscape Supply

135 Elm Street, Waltham, MA 02453

(781) 647-7500

www.bostonbark.com

- **\$75 delivery fee** to Boston area (Dorchester, Roxbury, Mattapan, Jamaica Plain, etc.) - varies depending on location
- **Compost:** \$38 per cubic yard
- **Loam:** \$32 per cubic yard
- **Compost/loam 50-50 mix, "Supersoil":** \$36 per cubic yard

Griffin Greenhouse & Nursery Supplies

1619 Main Street, Tewksbury, MA 01876

www.griffins.com

(800) 888-0054

- 6 cubic feet Whittemore vermiculite = \$26.50 (difficult to find large sized bags, great price!)
- 3.8 cubic feet compressed Fafard Peat Moss
(3.8 cubic feet compressed bales are easy to find at garden supply stores, typically ~ \$12)
- Ask about possibility of delivery (\$30)

Allandale Farm

259 Allandale Road, Brookline, MA 02467

www.allandalefarm.com

(617) 524-1531

- This farm sells **Intervale Compost** starting in the spring (April).
- \$6-\$8 for 20 quart bags
- \$14 for 2 cubic feet bags

Thayer Nursery

270 Hillside Street, Milton, MA 02186

(617) 698-2005

www.thayernursery.com

- This farm sells Organigrow (certified organic) compost in bulk beginning in April (call ahead to find out specific dates).
- **\$55 delivery fee** to Boston area (Dorchester, Roxbury, Mattapan, Jamaica Plain, etc.)
- **Organigrow compost:** \$66 per cubic yard
- **Do-It-Yourself option** - Shovel bulk compost on your own with personal containers: \$15 per personal barrel (large trash bin, about 30 gallons which equals about 4 cubic feet)

Mahoney's Garden Center

449 Western Avenue, Brighton, MA 02135

(617) 787-8885

242 Cambridge Street, Winchester, MA 01890 (for deliveries)

(781) 729-5900

www.mahoneysgarden.com

- **\$100 minimum** purchase for deliveries
- **\$90 delivery fee** to Boston area ((Dorchester, Roxbury, Mattapan, Jamaica Plain, etc.)
- **Compost Planting Mix:** \$7 per 1 cubic foot, \$11 per 2 cubic feet
- 1 cubic yard = 27 cubic feet

TRANSPORTING SOIL

If delivery costs are too high, consider renting a truck for picking up the soil. Or maybe you have your own truck you can use. Avoiding deliveries can help cut soil costs.

Home Depot rental truck

www.homedepotrents.com/truckrental.asp

- \$19 for the first 75 minutes, \$5 for every 15 minutes after
- \$69 for a day's use
- Plus cost of gas

Zipcar

www.zipcar.com

- Hourly rates: \$8-\$15 (Note: Membership required)
- Pick-up trucks seem to be available at a couple of the downtown Boston locations

A Personal Car

- Consider a DIY option of shoveling compost into trash barrels, such as at Thayer Nursery (see above)
- While transporting soil is a lot of work especially in a car, consider spending money saved on delivery to purchase supplies for Mel's Mix or higher quality sources of compost

SOIL CHECK LIST:

- ✓ **Calculate** how many cubic yards of soil your bed needs
- ✓ **Choose** the type of **soil mix** you want for your bed
- ✓ **Find** the most **affordable and accessible soil** vendor for your needs
- ✓ **Coordinate** how to get the soil to your raised bed: delivery, rental truck, or using a personal vehicle

USING YOUR RAISED BED

Congratulations! You chose a type of frame, you built that frame, and you got soil to put into your raised bed. You are now ready to begin planning and preparing your raised bed for an edible garden!

Square Foot Gardening

In order to maximize space and produce the most food in raised beds, it is essential to use the square foot method of gardening. Square foot gardening means that your garden is made into a grid with 1x1-foot squares. With the exception of a few plants, most squares enable you to have a different crop in each one. Better yet, this method is really simple to learn regardless of how new you are to gardening!

The Growing Guide

The Food Project has developed an extensive manual with many tips, resources, and instructions about the best methods for planning a productive garden in a raised bed. This Growing Guide includes information about:

- Square foot gardening
 - Step-by-step instructions for planning a garden
 - Planting methods
 - How to care for your garden
 - Seed catalogs, helpful books, and online resources
 - Planting schedules
 - Companion plants
 - Example garden plans
- ✓ **Download** your own copy of the Growing Guide at www.thefoodproject.org/bag

The Food Project's Workshops

We have ongoing workshops throughout the year that are geared to growing food in small spaces, with a specific focus on raised beds. Our workshops are always hands-on, often co-lead by staff and youth, and cover a range of topics from garden planning to starting your own seeds inside, as well as topics related to preparing and cooking food.

The Food Project's Build-a-Garden Email List

Sign up to receive monthly emails with garden tips related to square foot growing, planting dates, harvest information, plus regular updates about our upcoming workshops, community events, plant sales, & more!

- ✓ **Email** buildagarden@thefoodproject.org to request to be added to this email list

Send Us Your Feedback and Stories!

Was this DIY manual helpful? We'd love to hear your feedback, view photos of your building experience, and hear your garden stories. Please stay in touch!

****Send your comments to buildagarden@thefoodproject.org****