



# Lead-Safe Yard Manual

## A Do-It-Your-Self Guide to Low-Cost Soil Remediation and Safe Gardening

By Worcester Roots Project Staff  
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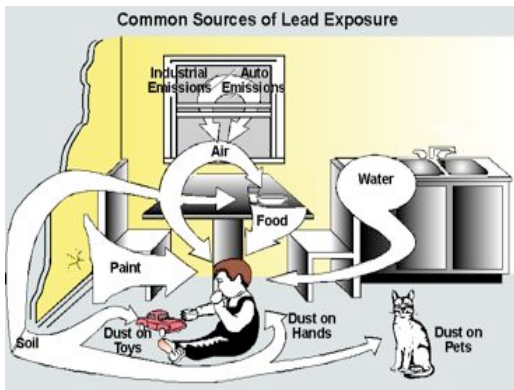
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## Introduction

### ***Background information about sources of lead***

Lead is a heavy metal. It was used in many materials and products such as paints used in older houses, lead solder used in plumbing, and leaded gasoline. Most houses built before 1978 contain some lead-based paint. Although laws now prevent lead from being used in many products, there can still be lead hazards in and around many homes. When lead-based paint deteriorates, chinks, or is disturbed during remodeling, repainting, or routine maintenance, it creates an invisible, tasteless, and odorless toxic lead dust.



Lead can get into the air, water, food, soil, and even dust and then can be breathed or swallowed leading to serious health problems, especially for young children. The tendency for the body to confuse lead for calcium accounts for the fact that lead is incorporated into bones and teeth. A young child's exposure to lead can cause learning and behavioral problems and possibly damage their brains, kidneys, and other organs. Lead does not degrade or lose its toxic effect over time and once it enters your bones it most likely will stay. It is really important to ensure that a child is not exposed to lead from birth until five years of age as that is the age the vital organs, senses and body is growing rapidly.

As mentioned above there are various sources of lead but we will be focusing on lead from paint. There can be lead both in and outside the house. The focus of this manual will be lead in the yards and soil outside the house as there are several resources from the government to deal with lead inside the house.

### ***Identifying lead on properties: THE SOURCE!***

Lead in soil is often found near old painted buildings and structures. It is also found near roads and in vacant lots where a building once stood. The first step in finding out if the yard is contaminated is to research information about the age of housing and, in case of a vacant lot, if there was a past structure that was demolished. The next step would be to do a visual assessment of the property, and then to test the soil for lead.

**Housing age:** If you are the property owner you may have the information on the property registration papers and if you are a tenant you could get the information from the owner. If you do not have the information about build date you can look up city records on the internet or request the information from the city's tax assessor's database. For Worcester you can get the information from: <http://www.worcesterma.gov/e-services/search-public-records/property-values> Enter either the street name, MBL number or owners name to look at information about the property. You should be concerned about the issue of lead if the house or structure on the property was built before 1978.



**Visual assessments:** Visual assessments help to identify areas around the property that are high risk for causing lead poisoning without actually testing. Even though we have seen a high correlation between visual assessments and soil test results, visual assessments alone cannot be used confirm lead contamination of soil. You can do visual assessments yourself by filling the simple form attached (Appendix A) with this manual that has been developed by Worcester Roots with other collaborative agencies. HUD defines deteriorated paint as: "Any interior or exterior paint or other coating that is peeling, chipping, chalking or cracking, or any paint or coating located on an interior or exterior surface or fixture that is otherwise damaged or separated from the substrate." You should look for deteriorated paint on all painted building components, especially any exterior walls, windows, or trim damaged from a roof or plumbing leak. Also look on surfaces that experience friction or impact like doors, windows, floors, and trim areas. In addition you should look for chipped paint on the yard around the house. The next step will be to check if there are areas of bare soil or thin grass that are greater than 9 square feet. The special risk areas for soil are drip lines – within 2 feet of the house, play areas, gardens (in native soil) and uncovered walkways.

If the house/ structure was built before 1978, and you see deteriorated paint or there is bare soil or thin grass in special risk areas, you should test your soil for lead. Testing is especially important if there are children under the age of six living in the house and if there is or will be a garden in native soil.

More information about visual assessments here:  
<http://www.worcesterroots.org/projects-and-programs/vap/>

## Soil Testing



### Suggested Sampling Materials:

- Gloves
- 1-quart Ziploc-style bags (one per composite sample, usually 1-4 per yard)
- Permanent marker (to mark bag)
- Record Sheet, Map Sheet (see samples Appendix B and C)
- Auger, shovel, trowel or similar tool
- Rag or paper towels
- *If windy/risk of creating dust:* Respirator (3M / HEPA filter)

### Sampling Procedure:

#### Step 1 – Identify Potential Risk Areas

With input from resident and/or owner, identify areas that are most likely to be a risk based on the following high risk factors:

- a. High use, especially by children (play areas, gardens, walkways)
- b. Bare soil
- c. Proximity to house (especially the “drip zone” within 3 feet of the house, aka “drip line”)
- d. Visible chipping paint or known former structures

Choose the areas to be tested and mark them on a Map (optional), drawn in the context of the property, streets, and compass heading (mark North on the map). Give each area a sample name/number (ex. #1 = Drip line).

#### Step 2 – Collect Composite Samples

Within each possible risk area chosen, collect 6-8 samples (evenly spread out in the area) in this way:

- a. Make a hole with auger, shovel, trowel or similar tool. The hole should be thin and approximately 6 inches deep. Take some soil from each depth of the hole either by scraping the tool along the side of



## Remediation (Making the Yard Safe!)

### *What can you do when you find out your yard has high lead levels?*

#### **0-400 PPM Recommended options:**

The EPA deems these levels safe for gardening and play. At levels of 200 and above, we still advise using compost amendment and/or phytoremediation (see below).



#### **400-2000 PPM Recommended options:**

- Build raised beds or containers gardens for immediate gardening
- Phytoremediation (see below)
- Compost amendment (in addition to diluting toxic concentrations, studies have shown high phosphorus compost amendment reduces bio-availability)
- Cover with 6 inches of clean soil, then stabilize or create a barrier using the following: perennial plants, wood chips, landscaping fabric, crushed stone, patio, stepping stones, etc.

#### **2000+ PPM Recommended options:**

Immediate Steps:

- Get children who have come in contact with infected area tested (blood lead level tests done at most doctor's offices and health clinics).
- Block off or cover area.

Long-term Solutions:

- Worcester Roots recommends permanent coverings (see above) for this level.
- Build raised beds or containers gardens for immediate gardening
- Some outfits recommend excavation or burying on site with proper safety precautions. This can be very costly, especially for disposal, and safety precautions are extensive (beyond the scope of this booklet).

### **LANDSCAPING Techniques**

- Design
- Material sourcing
- Implementation
- Post testing



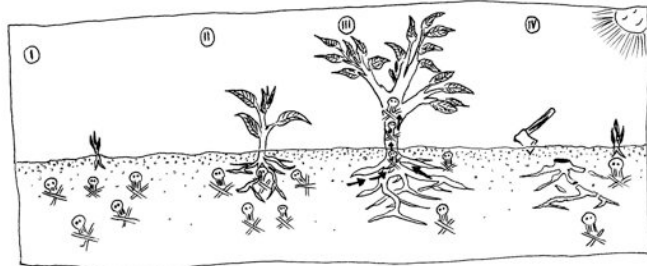
### **Phytoremediation**

- As densely as possible, plant hyper-accumulators, such as scented geraniums (others include indian mustard, sunflowers or spinach), to accumulate lead into the roots, stems and leaves of the plant. After the growing season, safely dispose of the plants (if you put into the municipal waste stream, ensure that your area has good lead protections on incinerators, landfills, etc.). Note: this technique is very slow, and depending on the lead concentrations and soil conditions remediation can take several growing seasons. Worcester Roots Project combines these phyto-extraction techniques with other lead-safe landscaping techniques in most cases.
- Stabilize the soil by planting plants that grow soil-retaining roots systems such as shrubs or ground-covers to reduce foot-traffic access and dust-creation. This process is call "bio-stabilization."

Contact Worcester Roots Project for detailed phytoremediation procedures:  
info@WorcesterRoots.org ~ 508-343-0035.

### Advantages of Phytoremediation:

- Inexpensive
- Does not disrupt ecosystems
- Low-tech, accessible
- Metals can be reclaimed



### Disadvantages of Phytoremediation:

- Remediation is confined to depth of roots
- Leaching into groundwater is not prevented
- Time consuming



### Compost Amendment

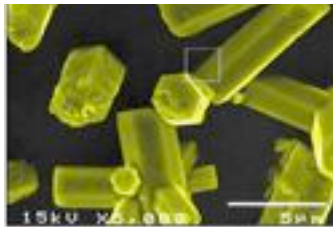


Figure 3. Pyromorphite crystals. Phosphorus from a

- Add 6-12 inches compost to your garden to dilute and bind up the lead.
  - You can reduce the amount of lead that is available to be absorbed into people's bodies by adding phosphorus to the soil (in the form of rock phosphate by forming pyromorphite crystals).
- Some cities and towns have free or inexpensive municipal composting programs. Worcester's Residential Drop-Off Center on 1065 Millbury St – formerly 115 Ballard St offers free compost. Call Worcester DPW for hours: (508) 929-1300.

### Other Landscaping Techniques

**Capping with clean soil:** Add 6-12 inches of clean screened loam on top of contaminated areas, then stabilize the new soil. Stabilization techniques include bio-stabilization (lawns, perennial garden beds, bushes, spreading ground covers such as pachysandra) or installing a hardscape (patios, walkways, crushed stone / peastone beds with sturdy edging).

**Drainage:** All our suggested hardscaping techniques are water permeable (as opposed to paving, for example) but most require drainage to be taken into account, especially when capping with clean soil is used, as to not have the capped soil wash away. Lawns that are the low-points of the yard often require a buried drainage pipe (also called French Drain) which is installed by digging a trench with at least a 1% slope, lining it with landscaping fabric, installing a drain pipe (ideally a 4 inch rigid plastic perforated drain pipe, flexible corrugated pipe can be used but is harder to clean out), then surrounded by crushed stone, and covering with landscaping fabric to divert water from undesired areas (like towards foundations or low lawns).

**Edging:** usually the most challenging aspect of hardscaping work, especially in the case of lead-safe landscaping where disturbance of native soil must be minimized. Some digging to set edging (blocks, plastic edging, rot-resistant lumber) is often unavoidable, but the more you can use existing edges or build up clean soil to retain hardscaping base or material the better. For all projects that include digging, remember to call dig safe (dial 811), use respirators (3M HEPA filter), coveralls, boot coverings, and other dust prevention such as tarps and wetting soil before displacement.



**Rain gardens:** also a great design element that address drainage and flooding issues. More info on Rain Gardens here: <http://www.raingardennetwork.com/build.htm>

See below for a full guide on how to make raised garden beds. Container gardens are a good immediate option for gardeners wanting to safely grow within one season. Get creative with your containers! Recycled bathtubs, bins, mini swimming pools make great container garden receptacle, as long as they have a way to drain access water.



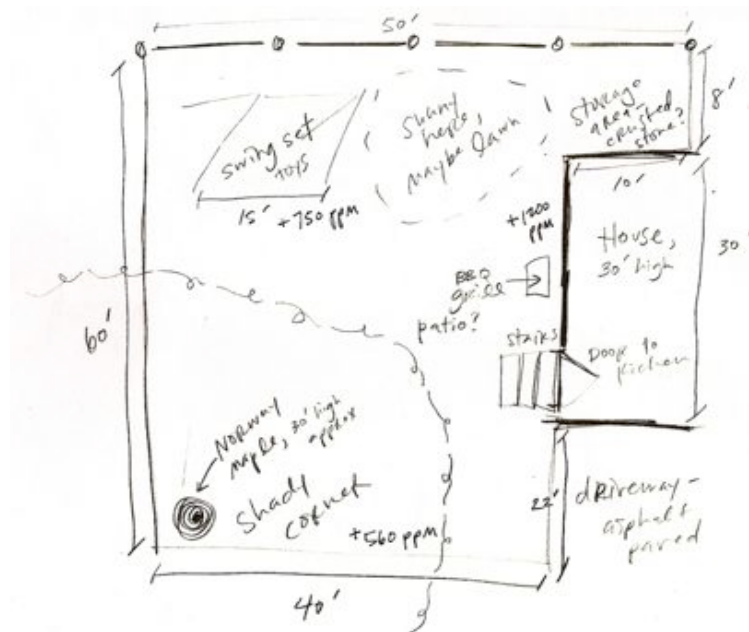
**For landscaping construction guides, try:**  
<http://worcesterroots.org/files/construction.pdf>  
[http://www.ehow.com/ehow\\_home-landscaping-basics/](http://www.ehow.com/ehow_home-landscaping-basics/)

## Measuring the site

### Equipment to measure the site:

- Camera
- Tape measure
- Line level, string
- Paper, pencil for sketching, clipboard

After determining that the site will be remediated, next measure and sketch everything on the site so that you can form a design and order materials without constantly needing to return to the site. It is hard to get everything you need at once, so take your time and draw everything clearly. Taking before pictures is useful to add details when you are making the design.



### Steps:

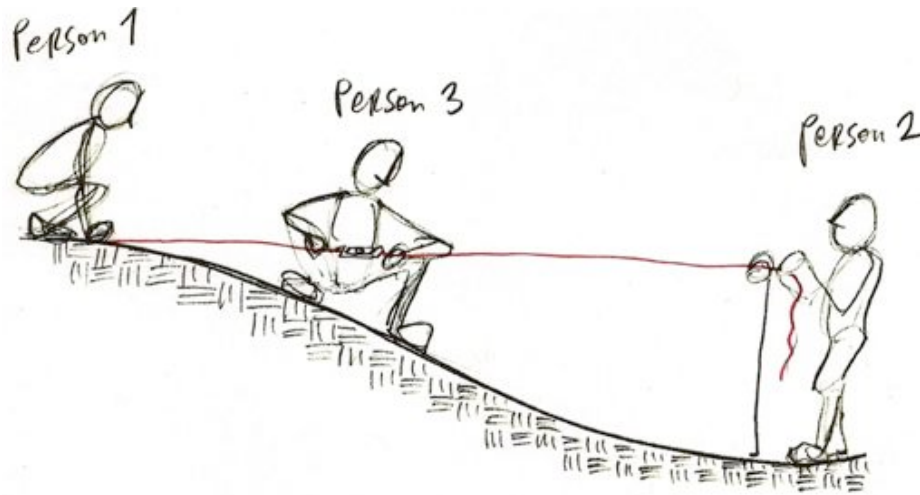
1. Measure and record the perimeter of the site
2. Measure and add permanent objects like plants, trees, walkways, buildings within the perimeter and label them.
3. Make notes about how these places are used, or observations you make about the place while you are out on the site.
4. Notice drainage systems, natural or human-made. Visiting the site on or just following a day of rain can be indicative of drainage issues or potential design challenges.
5. Write down any initial design ideas you have.

Primary sketches should be from a birds-eye view, with additional “elevations” with rise measurements if the site is not completely flat.

If there is a significant vertical elevation change on the site (a big slope), then you should measure the change in slope. To do this you need a tape measure, line level and string, and usually 3 people.

1. Start at the high point. Person 1 stands at the high slope and holds one end of the string at the ground.
2. Person 2 walks to the low point of the slope with the other end of the string, holding it tight.

3. When the line level and string level are level, person 2 measures how far is it from where (s)he is holding the string to the ground.
4. Now person 3 measures the length of the string from person 1 to person 2.

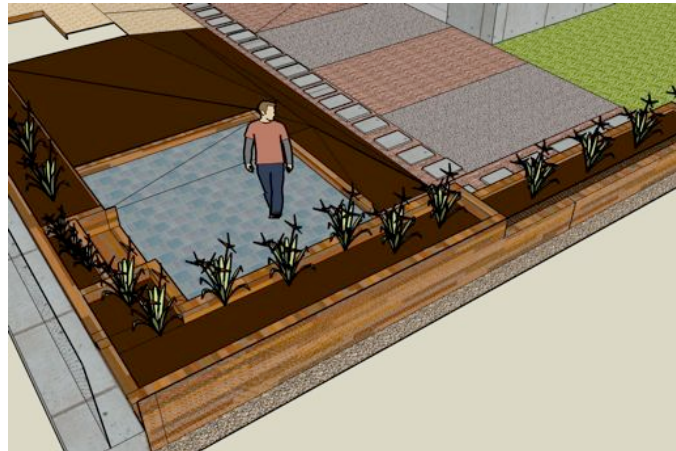


Now you have measurements you need to estimate the slope. To calculate the slope, divide the vertical distance (person 2's measurements) by the horizontal distance (person 3's measurement), multiply by 100 to get percent. Very steep slopes are over 50%. You cannot expect mulch or rock to stay on steep slopes. However, you can build retaining walls and plant plants on these slopes.

## Design

Your landscape design should prioritize 3 major elements:

1. **Function:** useful yard for residents (walkways, patio, lawn, garden).
2. **Beauty:** feel good about where you live.
3. **Safety:** Always keep the lead levels in mind. Write the levels in on the plan so you have a reminder of where there are high levels of lead. Highest levels = highest priority, but with children around, anything over 400 ppm is a priority. For the final design and during the work process, remember that the main goal keep people away from hazardous soil and prevent toxins from entering the home.



**Materials** to make the landscape lead-safe (this is not an exhaustive list, it is a list of relatively low cost materials that Worcester Roots Project often uses for landscaping):

- Clean soil (most ideal is loam, which is composed of sand, silt, and clay in about 40-40-20% concentration respectively)
- Landscaping fabric (use the 20 year thick fabric) and fabric staples
- Pavers (cement blocks for patios, with stone and sand base for drainage and flat-setting)
- Stone (stepping stones, crushed stone, pea stone, etc.)
- Mulch, wood chips, compost
- Rubber mulch (recycled tires for play areas)
- Lawn
- Perennials / shrubs
- Phytoremediation plants
- Raised garden beds and container gardens (wood, stakes/screws, re-bar)



### Commonly Used Tools:

- Shovel
- Pickaxe
- Rake
- Wheelbarrow
- For patios: rubber mallet, tamper, level
- For raised beds: drill (and bit just larger than re-bar and just smaller than spikes), sledge hammer, circular saw, scissors, safety goggles



1. **Function:** Include input of all residents that would use the yard. Residents will have to use this space for long after the landscaping is done, so put in a lot of thought into how each part of the yard will be used. Make the design according to the outdoor habits of the residents.

#### Additional suggestions:

- Connect doors and destinations with hardscape paths (high foot traffic on vegetation will wear it away and expose bare soil).
- Create sitting areas on pavement or stone, or locate them near doors, in decent sun/shade area, make it large enough for number of people using it.
- Lawn= vegetation that you can play on, people love it, but be careful to **only** put it on where it will grow successfully, where there is **direct** sunlight for several hours each day.
- Create play areas for children, which can be lawn, wood chip/ mulch, rubber tile area for play equipment, a sandbox or a patio.
- Plants: aim for low maintenance planting, good to put a planting bed around a yard as an edge, or to fill in under a tree/ in a shady spot. You can plant anywhere where people are not going to walk a lot and there is a water source nearby.

2. **Design:** Be sure to follow these basic principles of design:

- Use neat, clean geometries to designate different areas. A yard can look outstandingly better when it is organized well.
- You can use either curves or straight lines. Use sketch up model to visualize space.
- Create pieces that fit into each other. Don't leave any dead space where you do not know what is happening.
- Think about flow/movement of people through the space. What you build will affect how people will move.
- Think about how big the plants will be in maturity. You want your taller plants to be in the back, smallest ones in the front, so that none of the plants are hidden behind others. Plant in layers (sections).
- Think about flower bloom time of all the plants. You want to have plants that will bloom throughout the year, so be sure to pick some early bloomers, mid summer bloomers and late bloomers.
- People deserve to feel proud of where they live. Putting a lot of effort into improving outside appearance of home can do that.
- Take before and after photos to document the difference.

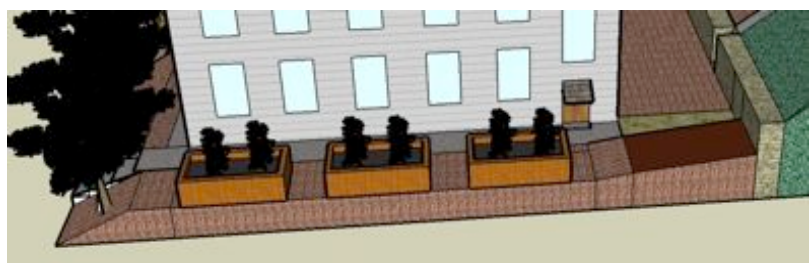
**Google SketchUp** is a great, free tool for landscape design.

Download it free:

<http://sketchup.google.com>

See the Worcester Roots Project's SketchUp Guide For Landscaping here:

<http://worcesterroots.org/files/sketchup.pdf>



## Plant Guide

The following is a guide to plants appropriate for New England climate and urban areas. It is not an exhaustive guide but lists some options to provide a starting point to choose plants.



Main considerations for picking plants are:

- Amount of sun exposure
- Size of the plant when it reaches maturity
- Soil preferences (plants in this list are not demanding on soil drainage/pH level of soil)

Other aesthetic considerations are:

- Flower bloom time/ color
- Fall color
- Deciduous vs. evergreen leaves.

### Woody Plants:

Name	Type	Size	Sun/ Shade	Flower Color	Bloom	Fall Colors
Buddleja/ Butterfly Bush	Deciduous Shrub	5'-8' tall and round	Likes full sun	Pink, purple, red or white flowers	July to September	No fall color
Clethra alnifolia/ Summersweet	Deciduous Shrub	5'-8' tall & 4'-6' wide	Likes sun and shade	White flowers	July to August	Yellow fall color
Cotoneasters	Deciduous groundcover/ Shrub	2'-3' tall & 5'-8' wide	Likes full sun	White/ pink flowers and red berries	Flowers in spring and fruit in fall	Purple-Red fall colors
Dennstaedtia/ Hayscented fern	Deciduous fern	15" - 30" tall	Likes sun and shade	None		
Ilex glabra shamrock Inkberry	Evergreen shrub	4'- 8' tall & round	Likes sun and shade		Black fruit in summer	
Juniper chinensis var. sargentii/ Spreading Juniper	Evergreen groundcover shrub	2' tall & 7'-9' wide	Likes full sun	Pale blue berries		
Parthenocissus quinquefolia/ Virginia Creeper	Deciduous groundcover/ wine	Can spread 25'	Likes sun or shade	White flowers	June	Red fall color
Vaccinium/ Blueberry	Deciduous shrub	2'-6' tall & 2'-6' wide	Likes sun and shade	White flowers	May	Red fall color



### Herbaceous Perennials:

Name	Type	Size	Sun/ Shade	Flower Colour	Bloom
Ajuga reptans/ Carper Bungle	Evergreen Groundcover	6" tall	Likes shade	Purple flower	Summer
Astilbe/ Falsespireas	Perennial	12"- 36" tall	Likes shade	White, lavender, pink or red flowers	June- August
Dicentra spectabilis/ Bleedinghart	Perennial	30" tall	Likes shade	Pink and white flowers	In spring
Galium/ Sweet Woodruff	Perennial Groundcover	4" - 9" tall	Likes shade	White flowers	In spring
Hermerocallis/ Dalilies	Perennial	12" - 18" tall	Likes sun and shade	Yellow or Red flowers	All summer
Hosta/ Plantainlily	Perennial	18" - 48" tall	Likes shade		
Iris Cristata/ Crested Iris	Perennial Groundcover	6" - 12" tall	Likes sun or shade	Purple flowers	In spring
Lavandula angustifolia 'Hidcote/ Lavender	Perennial	18" tall	Likes full sun	Purple flowers	In summer
Pachysandra terminalis/ Japanese spurge	Evergreen Groundcover	6' - 10" tall	Likes shade	White flowers	In spring
Rudbeckia fulgida var. sullivantii/ 'Goldstrum' Black-eyed Susan	Perennial	24" tall	Likes full sun	Gold flowers	In July/ August
Sedum/ Stonecrop	Perennial Groundcover	2"- 8" tall	Likes full sun	Yellow, Red or Pink flowers	In September
Stachys byzantine/ 'Silver Carpet' Lambsear	Perennial	12"- 18" tall	Likes sun and shade	Pink flowers and fuzzy foliage	
Thymus citriodorus/ Creeping thyme	Evergreen Groundcover	3" tall	Likes full sun	Pink flowers	In summer
Vinca minor/ Periwinkle	Evergreen Groundcover	3"-6" tall	Likes sun or shade	Blue flowers	In spring



### Ground cover plants for shade:

Plant Name	Height (in)	Remarks
<i>Aegopodium podagraria</i> 'Variegatum' Bishop's goutweed	10-12	Variegated, green and white foliage; aggressive.
<i>Arctostaphylos uva-ursi</i> Kinnikinnick	4-6	Evergreen; red, edible berries; use beneath established evergreens in acid soils.
<i>Convallaria majalis</i> Lily-of-the-valley	6-10	Fragrant, white flowers in May-June; inedible, red berries; aggressive.
<i>Euonymus fortunei</i> 'Coloratus' Purpleleaf wintercreeper	12-18	Foliage turns purple through winter; many other varieties available.
<i>Galium odorata</i> Sweet woodruff	6-8	Very aggressive; one of the best covers under shrubs; white, fragrant flowers in May-June.
<i>Lonicera japonica</i> 'Halliana' Hall's Japanese honeysuckle	6-12	Will also grow in full sun, but forms denser mats in shade; fragrant white flowers.
<i>Mahonia repens</i> Creeping Oregon grape	6-12	Evergreen; yellow flowers in spring followed by bluish-purple berries; holly-like foliage
<i>Vinca minor</i> Periwinkle	4-6	Semi-evergreen; white or purple flowers in spring.
<i>Waldsteinia ternata</i> Barren strawberry	4-10	Compact growth habit; fruit inedible.

## Construction Guide

### Raised Beds

Want to grow this season and worried about your soil being contaminated or not good enough quality? You can make a raised garden bed for about \$100 and fill it with fresh compost!

#### Materials Needed:

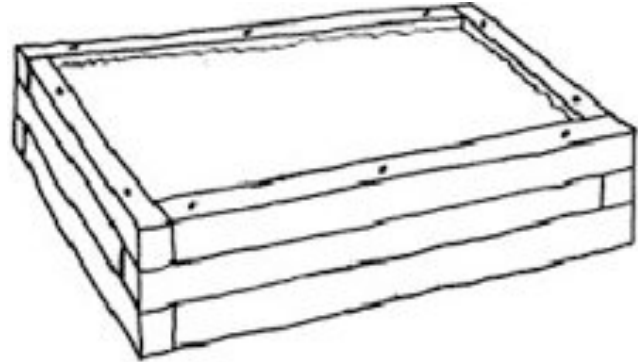
**Wood:** 4x4s in 3ft lengths or longer (our most common combinations: for 10ftx4ft bed that is approximately 1ft deep, we use six 10ft and three 8ft – cut in half – 4x4 timbers). Make sure to get alternatively pressure treated wood (ideally sodium silicate), especially avoiding those that contain Arsenic (most often in the form of Chromated Copper Arsenate – CCA) as you don't want to be putting toxins near your food crops! Some use 2x6 inch boards, but we've found that, though less expensive, they have half the life span.

**Spikes:** These are 6inch long nails. 30 spikes needed for each one foot deep bed. You can also use 6 inch screws such as "timberlocks" with a strong power drill or using pre-drilled holes in the timbers.

**Compost:** (soil made from composted organic matter such as yard waste) Make your own from food/yard waste, purchase, or look for free or inexpensive municipal composting programs.

**Landscaping Fabric:** To create a barrier under the bed so that water can go through but the plant's roots cannot. One small roll will be plenty, most hardware stores carry this.

**Tools:** Four-to-six pound sledge hammer for spikes, shovels for soil, scissors or utility knife to cut the landscaping fabric, gloves, eye protection and a circular saw if you need to cut the timbers to length.



#### Step-by-step Instructions:

- Find a flat place that gets lots of sun. Gather materials (see above). Cut lumber and landscaping fabric to desired lengths (see below for suggestions).
- Pin the landscaping fabric on the ground with fabric staples, then place the first level of boards on top in the shape and location desired. Notice how each piece of wood is touching the end of only one other piece (i.e. you do not want the end pieces touching the ends of both side pieces, etc.)
- Hammer the spikes into the ends of the wood horizontally – connecting them to the other pieces in the rectangle – and four spikes into the ground to hold the fabric bed in place. For hills, it is recommended to use re-bar that go through pre-drilled holes in wood and are pounded into the ground at least 1 foot deep.
- Lay the second layer remembering to rotate the wood so that no connection is directly above the one below it (see image above).
- Hammer the second layer vertically down into the first layer with spikes every 2-3 feet. Some horizontal spikes into the ends of the timbers are useful to keep tight corners.
- Repeat with a third layer, remember to rotate the layout again.
- Fill the bed with soil.
- Plant your organic vegetables!



#### Online instruction on how to make a patio/walkways:

<http://lowescreativeideas.com/idea-library/projects/DesignPatioorWalkway.aspx>

[http://lowescreativeideas.com/idea-library/videos/HowTo\\_lay\\_patio\\_foundation\\_0908.aspx](http://lowescreativeideas.com/idea-library/videos/HowTo_lay_patio_foundation_0908.aspx)

[http://lowescreativeideas.com/idea-library/videos/HowTo\\_install\\_paver\\_patio\\_0908.aspx](http://lowescreativeideas.com/idea-library/videos/HowTo_install_paver_patio_0908.aspx)

**Calculating Area and Volume:**

Length x width = Area

Area x height = Volume

1 yard (cubic yard) = 27 cubic feet

Remember to stay in same units (feet, for example, 4inches = 1/3 feet)

**EXAMPLE:**

You're filling material into a 7 foot by 12 foot space 4 inches high, how much material is needed in cubic yards?

$$7\text{ft} \times 12\text{ft} = 84\text{ft}^2 = 84\text{sqft}$$

$$4"/12"\text{ft} = 1/3\text{ft} * 84\text{ft} = 28\text{ft}^3 = 28 \text{ cubic ft}$$

$$1 \text{ yard (cubic yard)} = 27 \text{ cubic feet}$$

28 cubic ft	=	27 cubic ft
X cubic yds		1 cubic yard

$$27X = 1 * 28$$

$$28 / 27 = X = 1.04 \text{ "yards" (cubic yards)}$$



Answer: you'll need about 1 yard of material (a common size for a small tractor bucket, about one small pickup truck full). Stone is often sold by the ton. To approximate, one cubic yard of 3/8 crushed stone equals about 1.4 tons.

**Appendices:**

- Insert Visual Assessment form here **Appendix A**
- Soil Testing Record Sheet **Appendix B**
- Soil Testing Map Sheet **Appendix C**

**Sources / More Information:**

<http://www.epa.gov/opptintr/lead/index.html>

<http://www.mass.gov/dph/clppp>

Manual Developed by Anita Malpani with support from Matt Feinstein, Sarah Assefa, and the Toxic Soil Busters Cooperative



## Worcester Visual Assessment Form

Created by the Worcester Roots Project, Worcester Energy Beam-Raisers, and Regional Environmental Council to assess lead poisoning and other environmental hazard and energy inefficiencies in and around buildings within the City of Worcester.

Recorder Name \_\_\_\_\_ Team name (ex. Toxic Soil Busters, REC, WEED) \_\_\_\_\_

Address of assessed building \_\_\_\_\_ Date \_\_\_\_\_

POTENTIAL HAZARD External Deterioration	POSITIVE Above minimum levels	NEGATIVE Below minimum levels or N/A		
Siding	<input type="checkbox"/>	<input type="checkbox"/>		
Windows, Doors and Trim	<input type="checkbox"/>	<input type="checkbox"/>		
Roof	<input type="checkbox"/>	<input type="checkbox"/>		
Balcony/Porch/Stairs	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Soil</b>	<b>Yes</b>	<b>No</b>		
Bare soil at drip line	<input type="checkbox"/>	<input type="checkbox"/>		
Play area or garden present	<input type="checkbox"/>	<input type="checkbox"/>		
Other yard area >9 sq ft of bare soil	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Potential Weatherization Needed</b>	<b>Yes</b>	<b>No</b>		
Plumbing or Electrical Penetrations	<input type="checkbox"/>	<input type="checkbox"/>		
Moldew	<input type="checkbox"/>	<input type="checkbox"/>		
Cracks in the Foundation	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Likely Weatherization Needed</b>	<b>Yes</b>	<b>No</b>		
Old Spray foam (Orangeish color)	<input type="checkbox"/>	<input type="checkbox"/>		
Lifted or Missing Clapboards or Shakes	<input type="checkbox"/>	<input type="checkbox"/>		
Cracked Glass (Windows)	<input type="checkbox"/>	<input type="checkbox"/>		
Any Holes or Cracks in Siding	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Other healthy homes hazards</b>	<b>Yes</b>	<b>No</b>		
Unsafe stairs and porches	<input type="checkbox"/>	<input type="checkbox"/>		
Exposed electric lines	<input type="checkbox"/>	<input type="checkbox"/>		
Leaning frames	<input type="checkbox"/>	<input type="checkbox"/>		

Building Type	1	2	3	4
Building Type 1 = single family 2 = 2 or 3 family 3 = multifamily 4 = commercial	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Type of exterior 1 = wood 2 = brick 3 = aluminum/vinyl 4 = other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Replacement windows? 1 = yes 2 = no 3 = some	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Other observations, if contact made with resident, contact information.**  
 Other hazards not listed above, resident's contact info, any other observations worth noting, including presence of rodent traps, ice dams, smoke coming from chimney, etc.

Completed forms can be submitted online at: [www.WorcesterRoots.org/vap/](http://www.WorcesterRoots.org/vap/), mailed to: Worcester Roots Project, 5 Pleasant St, Worcester, MA 01609 or emailed to [info@worcesterroots.org](mailto:info@worcesterroots.org)

## Appendix B



### SOIL TEST RECORD

Site Name: \_\_\_\_\_

Address: \_\_\_\_\_

Date: \_\_\_\_\_

Name of Tester: \_\_\_\_\_

Name of Recorder: \_\_\_\_\_

Name of Composite Sample #1: \_\_\_\_\_

Name of Composite Sample #2: \_\_\_\_\_

Name of Composite Sample #3: \_\_\_\_\_

Name of Composite Sample #4: \_\_\_\_\_

Name of Composite Sample #5: \_\_\_\_\_

Other Notes:



# Appendix C

Site Name: \_\_\_\_\_

MAP SHEET



**Observations:**

<p><b>Key:</b> X = individual sample --- = composite sample boundary</p>
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