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What You Should Know - Basic Measurements and Bulk Materials Estimation

Getting it right - the first time.

Planning a project properly means knowing in advance what the project will cost. Properly estimating the cost of materials is the life's blood of any contractor, and it's a good idea for the homeowner, doing a project themselves, so they can budget their time and money efficiently. Determining the number of shrubs you need is rarely the problem for most folks; where people tend to run into difficulty is when they start estimating compost, mulch, and other bulk materials.

Measurements are your friend.

If you're not in a profession that regularly measures objects and distances for a living, you are probably going to be surprised what a tape measure ends up telling you. Believe the tape measure, not your guess!

Your measurements don't have to be accurate down to the inch to estimate landscape material needs reasonably; but you do need to be in the general ballpark. For small areas, a 25' tape measure does an acceptable job, but if you have large distances to measure, you may want to invest in a measuring wheel. Any tool supply store will know what you're asking for if you're not familiar with this tool. Don't sweat a few inches, but get a reasonably correct number to work with.

The circle, the rectangle, and the triangle.

It's time for a little math! If you can properly take one to two measurements for each of these shapes, you can quickly come up with an accurate square footage of any particular bed area. If you're not sure of how find the surface area of these shapes, you can find that information on the **Basic Landscaping Math 101 - Surface Areas** section towards the end of this article. It may be helpful for you to lay your bed shapes out on graph paper, if you're not getting a good feel for the quantities of material you need at this point.

Landscapes aren't exactly rectangular, triangular, or circular.

Landscapes tend to have gradual curves, big accent areas, and the occasional odd-shaped area. For beds with gradual curves, measure the bed in a spot that's not the broadest or narrowest, but somewhere in the middle to get a good average width. If you've a lot of different or sharp curves, sketch the area roughly out on graphing paper, and break the areas into rough shapes to quickly estimate the bed's surface area. (Example: If a bed is roughly 3' wide but bends out for an accent area 8' wide, you should break that bed into that 3' wide rectangle across the whole area, and then measure the remaining area as another square, rectangle, circle, or semi-circle. Simply add your two solutions for surface area to get the area of the entire bed. Don't sweat minor shape differences.)

Like we said before, don't worry about the inch here or there. Just get a good rough solution and it'll give you a reasonable number to work with.

I have my surface area of my bed - now what?

The volume measurement you need to keep in mind is this - one cubic foot is a 12"x12"x12" cube. One cubic foot will cover twelve square feet one inch deep. Think of a cubic foot as a twelve-deep stack of one inch thick square pancakes which are a foot on a side, if it helps grasp the volume better. Most of the time, you're adding mulch 2 inches at a time, or compost, or whatever - so plan on one cubic foot of material covering six square feet in that case.

A bulk scoop from our front end loader holds roughly 27 cubic feet (1 cubic yard). Bagged composts, soil builders, and mulches come in 1.5, 2, and 3 cubic foot sizes (check the bags for how much each holds).

Why you should always estimate slightly high if in doubt.

If you've estimated everything perfectly, you'll buy and use exactly what you need and have no leftover materials. Life rarely works like this however and it's not uncommon to get in to your project and find that you need just a bit more compost, mulch, etc., than you originally thought. This could be due to a modest measurement error, or perhaps you spread the material (compost, mulch) thicker than you meant to. Regardless of the reason you came up short, from a practical standpoint, it's always best to add a small padding to your materials estimate up front, i.e. instead of buying twenty bags of mulch, get twenty-one or twenty-two. Ten percent is a good "fudge factor".

A bit of extra material harms nothing when it comes to bed preparation or mulching, but coming up a bit short will. Save yourself the time, gasoline, and irritation. Buy a small amount more than you estimate you'll need - it's still usually cheaper than a return trip to the store, and it's certainly less frustrating.

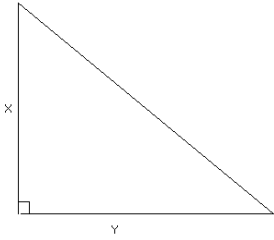
Basic Landscaping Math 101 - Surface Areas!

Here is a quick overview of a few essential formulae to properly plan your landscaping needs, along with practical methods to easily take the measurements you must have for your math to make sense.

Area of shapes:

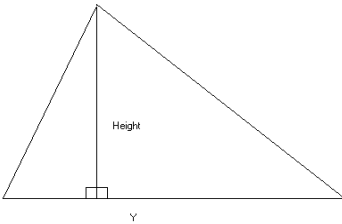


To find the area of a **square or rectangle**, multiply the length of the "X" side by the "Y" side - in this case, if the short side was 6 feet long, and the longer side 8 feet long, $(6*8) = 48$ *square feet*. A *square foot* is a flat square, one foot on a side. Measuring a square or a rectangle is straightforward. Just measure one side, then the other.

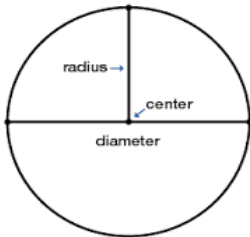


To find the surface area of a **right triangle**, multiply "x" side by the "y" side, and divide the result by 2.

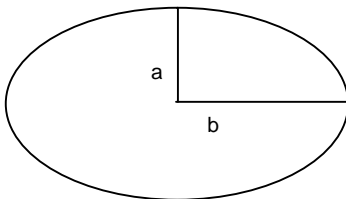
For any triangle which isn't a right triangle, just split the triangle into two right triangles. An easy way is simply to put out a tape measure end at the widest angle point of the triangle, and walk the line of the side across from the widest angle while holding the other end of the tape. Watch your measurement along that line - when you reach the shortest length of tape and moving further along the line will make you have to play out more measuring tape, you've found the height of the triangle. Multiply that height by the full length of the line you just walked along, and divide the result by 2.



To find the surface area of a **circle**, measure straight out from a point on the edge of the circle, reaching across, like you did in the triangle example. In this case, when your tape measures the *longest* distance across, instead of the shortest, you're properly measuring the diameter of your circle, dividing your circle in half. Halfway across the length of that measurement is the center of your circle - that halfway length is your *radius*.



If your shape is an **ellipse**, start on the end that appears longer (at one end of the "football") and find the longest distance across - halfway across is the center point of your ellipse and your first measurement. From the center point, measure like you did the triangle to find the *shortest* distance to the "other" side - that's the other measurement you'll need.



The area of a circle, to the limit you'll normally need in a landscape, is: $3.14 * (\text{radius squared})$. The area of an ellipse as shown in the diagram is: $3.14 * a * b$.

Don't sweat the small stuff:

The world won't end if your answer isn't correct down to the third decimal point. Just get an answer that's pretty close and you'll have a useful figure to work with. Landscaping doesn't require the accuracy of rocket science - we use rough and ready measurements to get the job done. Real flowerbeds and work areas almost never fit these shapes exactly. Use whichever of these formulae come closest to the shape of your work area.