

Estimating Concrete Amounts

When working on a local project involving concrete, nobody wants to suffer the consequences of either not ordering enough concrete to finish a job or getting too much and wasting money and excess material.

But using concrete in a local project doesn't have to end in either scenario. Municipalities can determine the precise amount of concrete needed for any type of project once they learn how to calculate the quantity using some basic math formulas.

If you know the length, width, and height of the space that you want to fill with concrete, then you can plug those measurements into a simple formula (length x width x height = volume) to get the precise quantity of concrete needed for a project.

UNDERSTANDING THE MATH

To start, let's review a little bit about math.

Convert to common units.

Before you begin your calculations for volume, you must convert all measurements into common units (such as inches, feet, yards, etc). How would you multiply 11 feet times 6 inches, for example? Obviously, you must convert either the 11 feet into inches or the 6 inches into a decimal part of a foot.

Calculating the Volume for Ordering Concrete

1. Convert all measurements into common units (usually into feet). If there are any fractions, first convert them into decimals.

EX: $3\frac{1}{2}$ inches = 3.5 inches ($1 \div 2 = .5$)

3.5 inches = .29 feet ($3.5 \text{ in.} \div 12 \text{ in./foot} = .29 \text{ feet}$)

2. Plug all measurements into the formula for volume – length x width x height (L x W x H) – to get a measurement expressed in cubic feet.

EX: 125 feet (L) x 4 feet (W) x .29 feet (H) = 145 cubic feet (Volume)

3. Convert cubic feet to cubic yards by dividing the measurement determined by the formula for volume by 27 (the amount of cubic feet in a yard).

EX: $145 \text{ cu. ft.} \div 27 \text{ cu. ft./yard} = 5.37 \text{ cubic yards}$ (round to 5.5)

Inches into feet—Converting the 6 inches into a decimal part of a foot is the preferred choice since in our English system of measurements, the “foot” is the base unit of measurement. This system then divides feet into smaller units (inches, fractions) or multiple units of a foot (yards, miles).

So, how do you convert 6 inches into feet? Everyone knows there are 12 inches in 1 foot. If you take the number of measured inches (6) and divide it by the number of inches in a foot (12), you will have the measurement expressed in feet (in decimal form). In our example, $6 \div 12 = .50$ feet.

Using this conversion formula in another example, you would change 7 inches into feet by taking the number of inches (7) and dividing it by 12 to get .583333 feet, which you can round to .58 feet.

Fractions into decimals—But, what do you do if your measurement is in fractions of an inch? Since you are changing the inches into decimal numbers, you will need to change the fractions into decimals.

To do this, simply take the top number in the fraction and divide it by the bottom number. For the fraction $\frac{1}{2}$, for example, you would divide the top number (1) by the bottom number (2) to get .5. For the fraction $\frac{3}{8}$, divide 3 by 8 to get .375, which you can round to .38.

With all the numbers now in decimal form, you can proceed with converting inches into feet as previously reviewed.

APPLYING THE CALCULATIONS

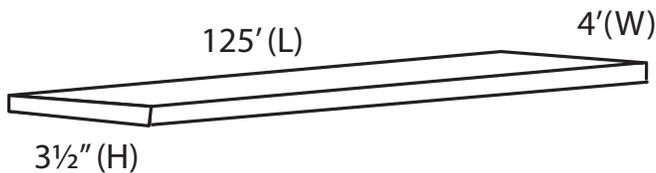
Once you have all the measurements converted into like units in decimal form, you are ready to apply some calculations to your measurements.

Use the formula.

Calculating the volume for concrete requires using three dimensions: length times width (which is area) times the height (thickness) or $L \times W \times H$. If you are using feet as your standard unit of measurement, this formula will give you the volume of concrete in cubic feet.

Most projects use standard-dimension lumber for forms: 2-by-4s or 2-by-6s. You would assume that a 2-by-4 is 4 inches wide, right? Well, that's no longer true with today's lumber. A 2-by-4 is now actually 3½ inches wide. That's important to know when you begin your calculations.

Let's try applying the calculations we have learned so far to an example project. You are pouring a sidewalk 4 feet wide by 125 feet long and using 2-by-4s for forms. To calculate the quantity of concrete needed for this project, you will use the formula $L \times W \times H$ to get the volume expressed in cubic feet.



Before calculating volume, convert the 3½ inches into .29 feet.

Plug your dimensions into the formula, keeping in mind that the height of the form is really 3½ inches, not 4. So your calculation will be 125 feet (L) x 4 feet (W) x 3½ inches (H).

Convert to common units. Before you can calculate this quantity,

Using a 2-by-4? Maybe it should be called a 1½-by-3½

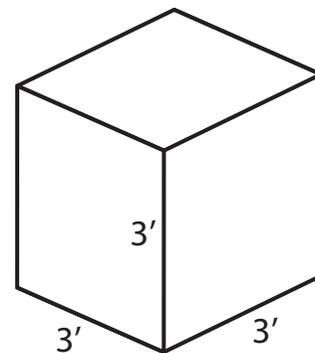
Remember to always measure any lumber you are using to make forms for pouring concrete into. Today's 2-by-4s are really only 1½ inches thick and 3½ inches wide and not 2 and 4 inches as would be presumed. The 3½ inches would be the height of many forms made for pouring concrete into. It's important to use the correct measurements if you want to accurately calculate the volume.

you have to convert the 3½ inches into feet. To do that, first change the fraction ½ into a decimal ($1 \div 2 = .5$) and add this to the 3 inches. Next, divide the 3.5 inches by 12 to change it into feet: $3.5 \div 12 = .29$ feet.

Plug measurements into the formula $L \times W \times H$. Now, you are ready to plug your measurements (all expressed in feet) into the formula $L \times W \times H$ to get the necessary quantity of concrete expressed in cubic feet (125 feet x 4 feet x .29 feet = 145 cubic feet).

Convert cubic feet into cubic yards.

Because concrete is measured in cubic yards, you will have to convert your cubic-foot measurement to cubic yards. Below is a cubic yard (remember 3 feet = 1 yard).



A cubic yard equals 27 cubic feet.

Using the formula $L \times W \times H$, we know that there are 27 cubic feet in a cubic yard (3 feet x 3 feet x 3 feet = 27 cubic feet).

To convert the cubic feet you calculated for the volume of your form into cubic yards, divide the cubic-foot measurement you calculated by 27. In our sidewalk project example, we determined that a sidewalk measuring 4 feet wide and 125 feet long (poured into a form made with 2-by-4s, which gives us a height of .29 feet) required 145 cubic feet of concrete. To convert to cubic yards, divide 145 by 27, and you will wind up with 5.37 cubic yards ($145 \div 27 = 5.37$).

Since concrete is usually ordered to the nearest ¼ to ½ cubic yard, you would round the 5.37 to 5.5 cubic yards.

By ordering this amount of concrete for your sidewalk project, you are guaranteeing that you will neither run short nor have too much excess concrete. Learning how to calculate the precise quantity of concrete needed for a project will save you time, money, materials, and aggravation.