All about **BIG** Cubes

First of all when I talk about a big cube I'm reffering to a cube bigger than a 5x5x5. I've heard that a 6x6x6 is the largest cube that could be made with the current design used for building cubes, but that it is also possible to overcome. The only way that I know of to use a big cube is on a computer, whether it be through a java applet or some other programming language. Below you'll find all the basic facts I've found about big cubes from my experience.

- Odd and Even
- How difficult is it to solve a big cube?
- How long will it take to solve a big cube?
- How long will it take me to solve a big cube?

 Odd and Even

The most important thing about these big cubes, which is in fact the very first thing you look at when solving them, is if it is odd or even. The 4x4x4 and 5x5x5 help illustrate this. The 4x4x4, as with any other even numbered cube, has no set center piece. Instead of one center piece an even cube has a group of four center pieces, like a square cut into fourths. An odd cube has one set center piece in the very middle, which means the centers can't be moved around in relation to each other, like on an even cube. Odd cubes are also easier to solve as they eliminate certain positions only possible on even cubes.

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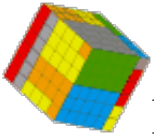
 How difficult is it to solve a big cube?

To put it in simple terms to solve a big cube is EASY. Surprisingly these larger cubes, despite their look are not very hard. I have been doing Rubik's Puzzles for about three years now and I think I can safely say once you get past the "stepping stone" 4x4x4 and 5x5x5 cubes big cubes don't take much more thought to learn to solve. From the first time I tried a 6x6x6 I must have solved maybe 5 or 6 6x6x6 and 7x7x7 cubes and then one 11x11x11 and I had refined my solution to work with **any** cube. Now I say that big cubes are easy but maybe I should clear something up. Big cubes are easy when compared to the 4x4x4 and 5x5x5. It took me, I believe, four months to be able to figure out a solution to the 5x5x5 that worked every time. Then after that I figured out the 4x4x4, which might have taken a week or two. After I had gotten over this

"stepping stone" as you can say then big cubes came very easily, as the 4x4x4 and 5x5x5 prepare you for almost everything that comes up. There are a few things that come up that you wouldn't expect but if you've gotten past the 4x4x4 and 5x5x5 then they won't stop you for very long.

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How long will it take to solve a big cube?

First I'll show you, roughly, how long it takes me to solve each type of cube. I'll also show you how to find out almost exactly how fast **you** will solve a big cube. Here's a list of some of the cubes I've done and roughly the time it takes me to do them.

Cube	Time to Solve
3x3x3	22.0 seconds
4x4x4	2 minutes
5x5x5	5 minutes
6x6x6	7 minutes
7x7x7	13 minutes
8x8x8	22 minutes
9x9x9	28 minutes
10x10x10	40 minutes
11x11x11	45 minutes
20x20x20	4 hours 24 minutes

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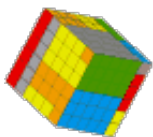
How long will it take me to solve a big cube?

This is a very acurate method of finding out about how fast you will solve each type of cube. I do this by a proportion of seconds per piece. For example I solve the Rubik's cube in 22.0 seconds on average. A rubik's cube has three pieces on each side (3x3x3) so that's nine "pieces" per face. There are six faces so the rubik's cube has 9 * 6 = 54 "pieces". Now divide the number of **seconds** it takes you to solve the cube, in my case 22.0, by the number of pieces, 54. This gives me a seconds per piece constant of 22.0/54 (or 0.4074). Now say I wanted to know about how fast I would solve the 11x11x11 cube. The 11 cube has 11 "pieces" on

each side so there are 121 pieces to a face. There are 6 faces so the 11x11x11 cube has 121 * 6 = 726 "pieces". Now since the 11x11x11 has more pieces to solve you have to look for them a lot harder during the solution, which means you lose time while you're looking. To help correct for this multiply your rubik's cube time by the number of pieces to a side of the cube you're using. In this case I would multiply my rubik's cube time by 11. The number you multiply by is the same number as the number of pieces per side (Ex. 11x11x11 would mean that you multiply your seconds for the rubik's cube by 11) Now your seconds per piece constant should be (your original time * 11) / (54). Once you get the new constant multiply it by 726 (the number of "pieces" on an 11x11x11 cube). This gives me a time of (22.0 seconds to solve the Rubik's Cube * 11 pieces on each side of 11x11x11 cube) / (54 pieces on a Rubik's Cube) * (726 pieces on an 11x11x11 cube) = 3253.555

This means that it would take me about 3253.555 seconds to solve the 11x11x11 cube.

3253.555 / 60 = minutes
minutes = 54.2259 (or 54 minutes 13.56 seconds)

As you can see this is very close to my actual time of 56 minutes 32.30 seconds. In this case I was measuring how fast I would do the 11x11x11 cube if I did it proportionally to my speed on the cube. If you wanted to find out the fastest you would do an 11x11x11 cube then use your fastest rubik's cube time. If you want to be even more accurate use an average of ten times as your rubik's cube time. If you just want to see how fast you'll do a big cube for the first time then use your worst rubik's cube time. After a while of doing these cubes you'll get to to the point where you'll start to speed up and you might actually be faster on a large cube than the formula predicts. This either means that you're faster on the rubik's cube than you think you are or that you're just getting better at the larger cubes. It helps a lot to know about how long it would take you to solve a big cube (especially if you are planning on trying a 20x20x20 or larger).

Here's the formula for calculating the time it would take you to solve an NxNxN cube,

Rs = Number of Seconds it takes you to solve the Rubik's Cube* Scroll

down for more info

N = Number of pieces to an edge of the NxNxN cube (ex. 11x11x11 cube N=11)

Ns = Number of seconds it takes you to solve an NxNxN cube

$$\frac{(Rs * N)}{54} * 6N^2 = Ns$$

$$\frac{Ns}{60} = \text{Minutes it takes you to solve an NxNxN cube}$$

$$\frac{Ns}{3600} = \text{Hours it takes you to solve an NxNxN cube}$$

$$\frac{Ns}{86400} = \text{Days it takes you to solve an NxNxN cube}$$

* If you alter your Rubik's Cube time in the formula you can find more exact times for the larger cubes. If you're just trying a big cube for the first time then pick your worst rubik's cube time (ex. Your time when everything seems to go wrong). The reason for this is because the first time you try a big cube, everything goes wrong, you mess up a lot, you have to stop to find pieces a lot. If you're used to using big cubes then use one of your fastest rubik's cube times to get a closer estimate of how fast you will solve a big cube. This also lets you find a pretty good estimate of the fastest possible time you could solve a big cube. For example using my fastest rubik's cube time, 17 seconds, I know that the fastest I could do the 11x11x11 cube is 41 minutes 54.11 seconds. This can help to show how much room for improvement you have.

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