[[SOLVE THE CUBE]]

Intermediate Method by Tim Pow

Welcome to the Intermediate Method, a method specifically designed to follow the Beginner Method I wrote. This solution is proven to be a lot faster than the Beginner Method, *however*. Keep in mind that whilst learning this, you will become a lot slower *at first*. Do not let this discourage you. This is the way that I learned (though probably not as efficiently as I am teaching you now) and the way I teach everyone, and I can confidently say that this is a step forward, not a step back. Just keep at it.

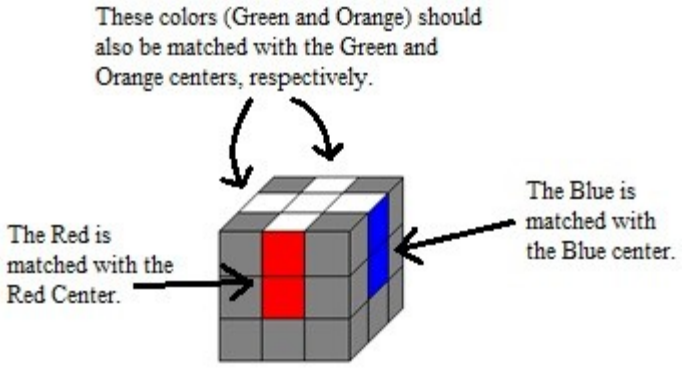
This is the second of four installments: Beginner, Intermediate, Advanced, and the full Fridrich Method.

Each method is designed to facilitate faster learning and improvement in the next method in the series, with the final goal being the method all the pros use (Fridrich Method). I believe this series is the best way to learn to solve the cube – in record time.

So without further ado, I give you [Solve the Cube] – Intermediate Method.

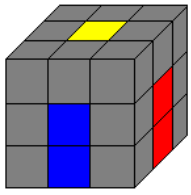
- **[STEP ONE] – Cross On White**

In the Beginner Method, you solved the White cross on Yellow, then moved it to the White side. Now, you will learn to do this directly onto the White side. This is probably the hardest step, since there are no real algorithms. You really just need to play around with the cube to get a bettter understandig of how pieces move around.



Remember that when you solve the Cross on White, the White Cross needs to be solved as well as the colors on the sides. In the above picture notice how the White Cross is done, and the secondary colors (in this case the visible colors are Red and Blue) are also matched with their corresponding centers. So in the Beginner Method, you solved the White Cross on Yellow first, without caring about the secondary colors. However, now you need to move specific colored pieces to specific locations, which in my opinion is the most difficult step to learn. But once you figure it out, it becomes the easiest and fastest step of solving the cube.

Again, once you are done, make sure to hold the cube with White on bottom and Yellow on top for the remainder of the solve.



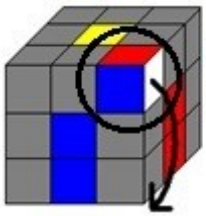
- **[STEP TWO] – First Layer Shortcuts**

Now this step is exactly the same – however there are some shortcuts available to make this step go a lot faster. Recall that after finding a corner piece with White on it in the top layer you apply the algorithm: R U R' U'

This is simple enough…however this can take up to *5 times to actually solve the corner*. This can take a while. So here are some cases to speed it up a bit.

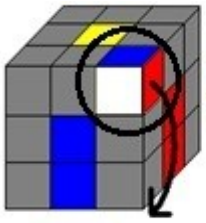
Case #1: This is the simplest case. After you set up a White corner piece to get ready to place, look at where the White is on the piece itself. If the White is on the side of the piece (the right side) just apply the algorithm you already know and love: **R U R' U'**

You will only need to apply the algorithm once.



Case #2: The next case is when White is in the front. The algorithm you will be using is the *inverse* of the previous algorithm: **U R U' R'**

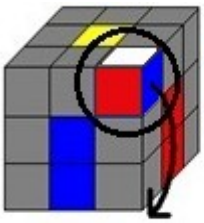
You will only need to apply the algorithm once.



**The inverse of an algorithm is basically another algorithm that will *undo* the first. For example, take this random algorithm: R U The algorithm that will undo this (the inverse) is this algorithm: U' R' Try it!

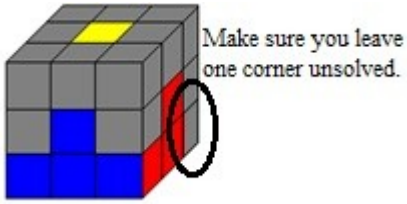
Case #3: The next case is when White is on the top. You will be using a combination of two algorithms, one right after the other: **[R U2 R' U'] [R U R' U']**

You will only need to apply the algorithm once.



**Notice, the second half of the algorithm is one you already know (Case #1). What the whole algorithm basically does is it first moves the White onto the side of the corner piece, turning it into Case #1, and then it solves Case #1, all in one fell swoop.

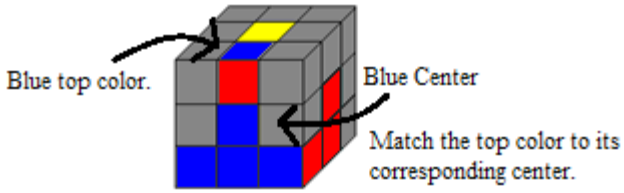
HERE IS WHERE IT GETS DIFFERENT. Make sure to solve *only 3 corners of the first layer*. You need to leave one corner unsolved. This is really important. Any corner will do—you'll see why in the next step.



- **[STEP THREE] – Keyhole Method**

Normally, in this step you would apply this very long algorithm (8 moves long!): U R U' R' U' F' U F
On top of that, you would have to use it several times! But you don't need to for the Keyhole Method. As I mentioned earlier, you need to have one "slot" in the bottom layer unsolved. This "empty slot" is called the "keyhole." This is where it gets a little tricky.

First, pick a piece in the top layer that does not have yellow on it (same as before) but instead of matching the front color with its corresponding center, match the *top color* with its corresponding center.

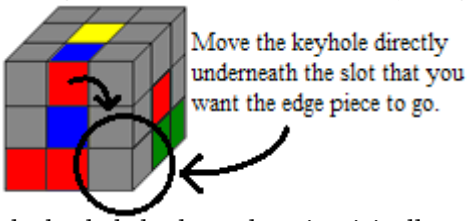


Then determine if it needs to move to the left or to the right, and apply the following algorithms:

Move to the RIGHT: **R U' R'**
Move to the LEFT: **L' U L**

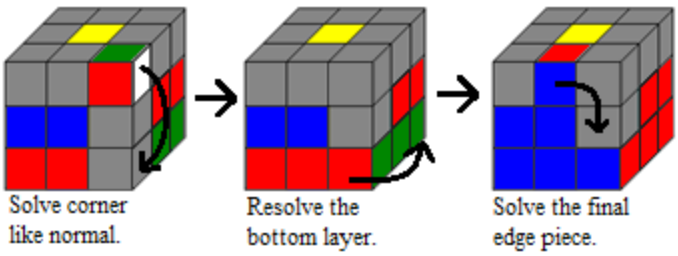
BEFORE YOU APPLY ANY OF THESE ALGORITHMS, THIS IS WHEN YOU USE THE KEYHOLE.
In the picture above, the piece needs to move to the right. But if you simply apply the RIGHT algorithm, you will unsolve the Red, White, and Blue corner piece below in the bottom layer. To avoid this, you will use the keyhole.

Move the keyhole (by doing **D** or **D'** or **D2**) so that it is *directly underneath* the slot where you want the edge piece to go (in this case, applying **D'** so the keyhole is under the solved position of the Red and Blue edge piece). Now, since the keyhole is "empty," when you apply the algorithm, it doesn't mess up anything.



Once the edge piece is in its place, move the keyhole back to where it originally was, and repeat the process until *all but one of the edges in the second layer is solved.* When you have one edge piece left, move the keyhole so that it is underneath that final slot. Solve the *bottom layer* through the empty edge slot the same way you would have done in Step 2, and move the now filled keyhole back to its solved position. Then, finally solve the last edge in the second layer using one of the old LEFT or RIGHT algorithms.

Old RIGHT: **[U R U' R' U'] [F' U F]**
Old LEFT: **[U' L' U L U] [F U' F']**



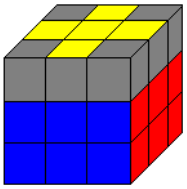
Keep in mind that this can be very confusing. You should read it over again and feel free to ask me any questions you may have. Don't be discouraged, you can do it, and it does make sense. You've got this!

- **[STEP FOUR] – OLL Shortcuts**

For the OLL step in the Intermediate Method, there aren't very many shortcuts at all. There's really only one worth mentioning, but this step is probably one of the faster parts of your solve anyway.

PART 1: Edge Orientation (Same)

There are actually no good shortcuts for this half of the OLL (at least in the Intermediate Method), so solve this like normal.



PART 2: Corner Orientation Shortcuts

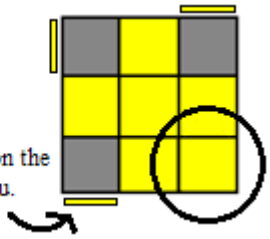
Now this part is almost the same…again, there aren't many good shortcuts for this step in the Intermediate Method. However, there is one that I would recommend. (This shortcut is only for Case #1)

Recall that in Case #1 of the Beginner Method, you used the algorithm: R U R' U R U2 R' and all you looked for on the cube were the three corners that did not have yellow on top. However, although this case was simple, it could sometimes require that you apply the algorithm more than once. To avoid doing the algorithm several times, now you should also pay attention to the yellow on the sides of the corners.

When looking at Case #1, still find the corner with yellow on top (same as normal). But before you apply the algorithm, look at where the yellow is on *the two corners directly adjacent from it* (not the diagonal corner). Now depending on these corners, you can either get the Right-Handed Case, or the Left-Handed Case:

LEFT-HANDED CASE

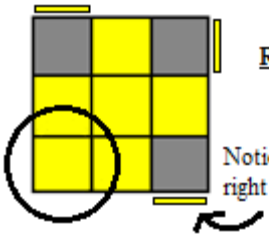
Notice how the corner piece on the left contains yellow facing you.



[L' U' L U'] [L' U2 L]

RIGHT-HANDED CASE

Notice how the corner piece to the right contains yellow facing you.

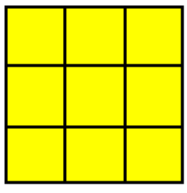


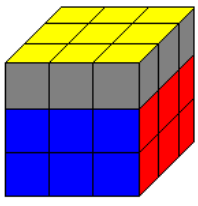
[R U R' U] [R U2 R']

The Right-Handed Case uses the same algorithm that you already know. The Left-Handed Case uses the *mirror* of the Right-Handed Case, so it is relatively easy to learn.

For both cases, you will only need to apply the algorithm once.

**The mirror of an algorithm *is not the same* as the inverse. The inverse is the reverse of the original algorithm, while the mirror is simply the mirror of it (pretty self-explanatory). It's like performing an algorithm in front of mirror and repeating what you see. For example, take the algorithm: R U The mirror of this would be: L' U' Try it!



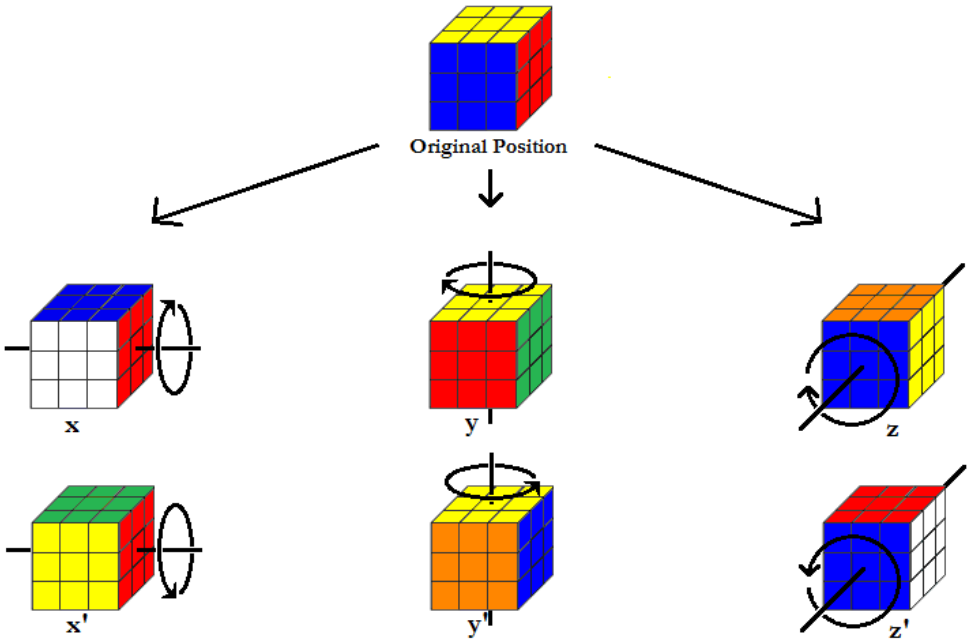


- **[STEP FIVE] – PLL Shortcuts**

PART 1: Corner Permutation Shortcuts

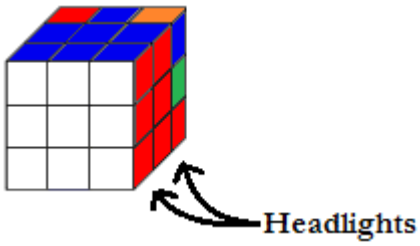
This shortcut isn't a real shortcut, per say, but more of a tip. As you probably know, the following algorithm for this step is quite awkward and slow to execute: R' F R' B2 R F' R' B2 R2. However, there is a better way to *hold the cube* to make the algorithm a little more comfortable and quick.

You already know a lot of cube notation, like R, F', U2, etc. But there are more moves than just twisting the sides of the cube. There are also "cube rotations." This is when you literally hold the cube differently in your hands (by rotating the entire cube). And there is notation for this. They are as follows:



As shown above, you can think of **x**, **y**, and **z** as signifying a rotation around the x-axis, y-axis, and z-axis respectively, if it helps you. Also, notice how the **x** rotations follow the **R** layer, the **y** rotations follow the **U** layer, and the **z** rotations follow the **F** layer. Now, back to the actual shortcut.

First, find the headlights and place them in the back of the cube, like normal. Once that is set up, you need to do an **x** rotation before you do any algorithms, putting the headlights on the bottom of the cube. So, the cube looks like this in your hands:



Then you will do the same as above—*however*, since you have now rotated the cube, the relative moves are different. Instead of doing the same exact algorithm, you will do: R' U R' D2 R U' R' D2 R2. Notice that this is the same algorithm as before and has the same function. But now, since you are holding the cube differently in your hands, the literal moves you do are not the same. So all in all, the algorithm for this step is:

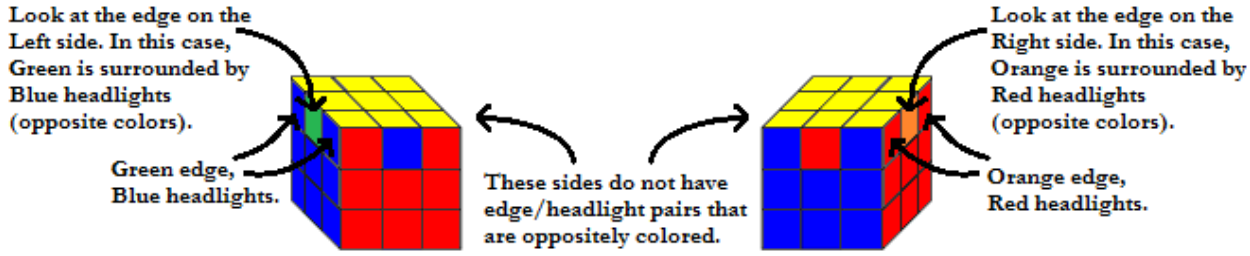
[x] [R' U R'] D2 [R U' R'] D2 R2

I find this to be much easier and faster to do than doing an F or a B2 like in the previous version.

PART 2: Edge Permutation Shortcuts

For this last part, the shortcut is fairly simple. Normally, you would find the fullbar, put it in the back of the cube, and then apply the following algorithm: R U' R U R U R U' R' U' R2. But sometimes, this can take up to two times to actually solve the cube. To avoid this issue, there are Right-handed and Left-handed versions of this algorithm.

After placing the fullbar in the back, look at the left and right sides of the cube. Pay attention to the colors of the remaining edges to be solved. As you know, certain colors are always on the opposite side of others—like white is to yellow, blue is to green, and red is to orange. When looking at the remaining edges, check to see which edges are oppositely colored to the headlights surrounding it. Whichever side is oppositely colored (left or right side) corresponds to the Right or Left handedness of the algorithm to be applied.



LEFT-HANDED CASE

[L' U] [L' U' L' U'] [L' U L U] L2

RIGHT-HANDED CASE

[R U'] [R U R U] [R U' R' U'] R2

Notice that the Right-handed algorithm is the same as the one you already know for this step, and the Left-handed algorithm is just the mirror of it, so it is relatively easy to remember. You will only need to apply the algorithm one time, as opposed to the possible two times in the Beginner Method.

Fin.

And there you have it. That's all there is to the Intermediate Method. With this new method, your times should decrease by at least 20 – 30 seconds, albeit at first you will probably be slower since you are learning something new. But before I end, I would like to mention one more general "shortcut" to solving the cube faster:

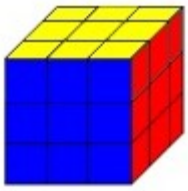
- **Fingertricks**

At this point, you should try experimenting with "fingertricks." Fingertricks are when you use the tips of your fingers to flick the sides of the cube, optimizing cube movement while minimizing hand movement. If you do not do finger tricks, you probably just grab the sides of the cube with your hands and twist them like that. But this can only be so fast. Utilizing finger tricks is an important part of why record holders like Feliks Zemdegs and Yu Nakajima can solve the cube so quickly. So it is very much worth your while to try it out. And when it comes to finger tricks, it's really all up to your personal preference and what *you* feel is comfortable. There are many different ways to do finger tricks, and there is no single "correct" way to do it. Just do what feels natural.

If you've made it all the way to the end of this manual and are reading this, then kudos to you. You've made it through and you *will* get faster, as long as you keep at it. And you don't need to practice every day. Just pick it up once in a while when you're watching TV, or take it with you in your backpack just to take out when you find you have some free time on your hands. It really doesn't take much to improve. I apologize that this guide was quite wordy—I found whilst writing this that the Intermediate Method requires significantly more explanation than the Beginner Method did. And as always, if you have any questions at all about any of this, please do not hesitate to contact me. Thanks for listening, and keep cubing!

Tim

NOTATION PAGE



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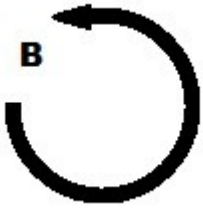

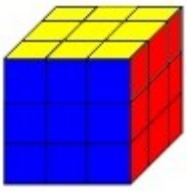

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