

RUBIK'S CUBE SOLUTION FOR BEGINNERS

Make sure to watch BadMephisto's "How to Solve a Rubik's Cube" video!

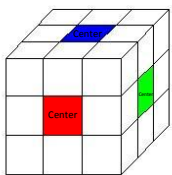
<http://youtu.be/609nhVzg-5Q>



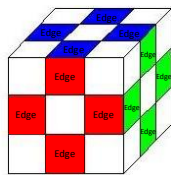
INTRODUCTION

Have you ever wanted to solve a Rubik's Cube? You are not alone! Since 1980 there have been **350 MILLION CUBES** sold, making the Rubik's Cube the **MOST POPULAR PUZZLE GAME EVER!** There are **40,000 YouTube VIDEOS** that show how to solve it, world speed records, strange shaped "twisty puzzles", and lots of other fun cube stuff. This paper from Mr. Pass will show you a simple solution that you can understand! I would also highly recommend watching the video in the yellow box above. That will help a lot! 😊

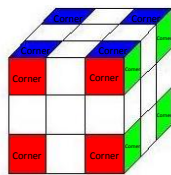
PIECES



Centers



Edges



Corners

The big picture at the top of the page shows a cube taken apart. Even though there are 54 stickers (9 on all 6 sides), each sticker can't move to just anywhere. Every **corner piece** has three stickers that are always next to each other, and every **edge piece** has two stickers that are always next to each other. There are 20 pieces that you have to put in the right place. Also, it is important to know that the center stickers never really move. They just spin around! **The center stickers show the final color for each side.**

MOVES

There is a special way to write the moves of a Rubik's Cube. Just about **everyone** uses the same "alphabet" to write these moves. In Mr. Pass's opinion, there could be easier "alphabets", but since just about **everyone** uses this one, it seems we're stuck with it. I have two "helpers" below to make it easier to learn:

Helper #1: Go to <http://www.cubewhiz.com/notation.php> This page is fantastic!!! It shows each turn in a very easy to see animation! I wish I had this when I started learning.....

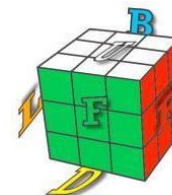
It shows you this: **(Be careful! The "direction" (clockwise or counterclockwise) is "as if you were looking at that side".)**

R L U D F B → Turn that side "once" **clockwise**.

R' L' U' D' F' B' → Turn that side "once" **counterclockwise**.

R2 L2 U2 D2 F2 B2 → Turn that side "twice" (all the way around to the other side).


Helper #2: If you can't get to a computer, use the picture below. It shows the six sides of the Cube and the letters that are used for turning each side:



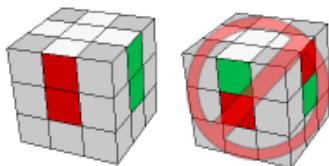
right left up down front back
R L U D F B

STEP 1: FOUR WHITE EDGES

When the four white edges are fixed, they look like a white "+". Speedcubers call this first step "the cross".

You can figure this out by yourself with a little practice, but the YouTube video below includes a couple of complete examples starting at the four-minute mark. 

<http://youtu.be/609nhVzq-5Q>



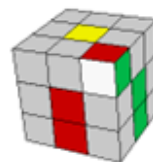
STEP 2: FOUR WHITE CORNERS

Now put the white side with the cross on the bottom. It will stay there & yellow will be on top until you finish the cube.

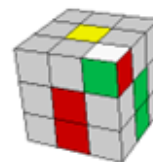
Each pattern of moves below moves a white corner from the top to the bottom (exactly below it) without messing up the cross you made in Step 1. Make sure you put the corners between the right sides, like green and red below.



$R U R'$



$F' U' F$



$R U^2 R' U' R U R'$

STEP 3: MIDDLE LAYER EDGES

Now you're done with the first layer!!! Yay! After fixing the four pieces in this step, you'll be done with the first two layers! Woohoo!!!

Put the edge piece on the right side touching the same color below it. Then look at the two pictures below carefully. If the piece needs to move towards you (to the front), then use the left pattern. If it needs to move away from you (to the back), then use the right pattern.



$R' U' R' U' R' U R U R$

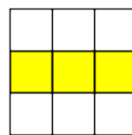


$R U R U R U' R' U' R'$

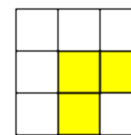
STEP 4: TURN THE TOP LAYER EDGES SO THAT YELLOW IS FACING UP

Usually you will already have some edges yellow on top, but if there aren't any, then use the pattern on the left and then the pattern on the right.

By the way, a lower case **f** turn is like an upper case **F** turn, but you turn the middle slice **and** the front face.



$F (R U R' U') F'$



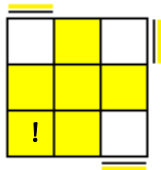
$f (R U R' U') f'$
or $U^2 F (U R U' R') F'$

STEP 5: TURN THE TOP LAYER CORNERS SO THAT YELLOW IS FACING UP

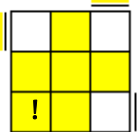
Pattern: $R U R' U R U^2 R'$

You might have to use this pattern 3 or 4 times, depending on what the corners look like after step 4.

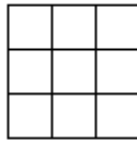
If **ONE** corner already has yellow facing up, then move it to the left side, closer to you. Then use the pattern.



OR

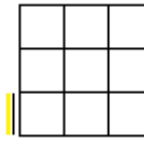


If **TWO** corners already have yellow facing up, then move the top layer until a yellow sticker is on the left side, closer to you, **facing front**. Then use the pattern.



(view from top)

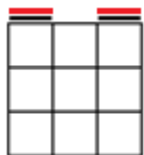
If **ZERO** corners are yellow: move the top layer until a yellow sticker is on the bottom left, **facing left**. Then use the pattern.



(view from top)

STEP 6: TOTALLY FIX THE TOP CORNERS

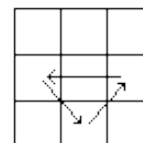
Two corners of the same color, like the two red stickers in the picture below, are called "headlights". Turn the top layer until these are in the back. If you do not have any "headlights", do the pattern once and then you will!



$R' F R' B^2 R F' R' B^2 R^2$

STEP 7: TOTALLY FIX THE TOP EDGES

Turn the top layer until the one fixed edge is in the back. If you do not have one fixed edge, do the pattern once and then you will!



$(R U') (R U) (R U) (R U') R' U' R^2$