

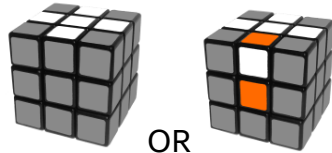
Solving a Rubik's Cube

(First solved by Jeff 4/29/2019, Ella 4/30/2019)

Leveraging source instructions: <http://rubiks-cube-solver.com/how-to-solve>

STEP 1: The Cross

- 1) Put white center on top, Move 4 white edge pieces to top cross or edge directly touching top cross



OR

- 2) Use Algorithm to rotate any edge not on top to top.



- a. Algo #1:

F R' D' R F2

- 3) Perform a "U" move until you have 2 or 4 edges matching the center



- a. If 4 match, then you are done
- b. If 2 match AND they are adjacent (next to each other), hold cube with solved pieces facing front and left. Then do algo #2



R' U R U' R'



- c. If 2 match AND they are opposite, hold cube with solved pieces facing right and left. Then do algo #3



R2 L2 U2 R2 L2



Goal at end of this step: White cross on top + match colored piece in 1st and 2nd layer of center on each edge touching cross

STEP 2: The White Corners

- 1) Find white-orange-green corner (rotate bottom layer if needed) until at top right (purple) or bottom right (pink)



- 2) If on bottom (shown in pink), repeat algo #4 until it moves to correct top position with white up



- 3) If on top (purple), do algo #5 below to move to bottom



- 4) Repeat the process until top is white + the white corners have the right colors to match the centers of the face they touch. **(Important: Make sure white on top, colors match centers of face they touch)**

STEP 3: Middle Layer Edges

- 1) Flip over to put yellow center on top.
- 2) Perform "U" move to rotate top to get matching colors in center (Ex: Green) and top having color matching left or right face. **(Important: Make sure the edge colors match centers of face they touch)**
- 3) Use algo #6 below to move LEFT



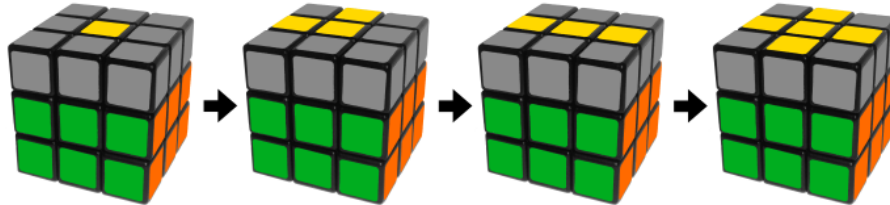
- 4) Use algo #7 below to move RIGHT



- 5) If a piece is in the wrong spot, move an edge with yellow in it using one of above to replace it and put the wrong spot one back on top.

STEP 4: Yellow Cross

- 1) Build Cross: Put Yellow on top, orient cube to which picture matches closest. Use algo #8 below to transform to next state until cross is reached:



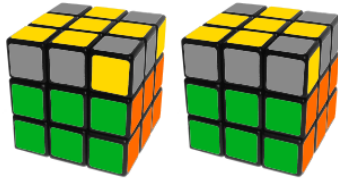
Do this to transform to the next state: F R U R' U' F'

STEP 5: Sune / Antisune (getting top all yellow)

- 1) Repeat algo #9 below until you have only one yellow corner

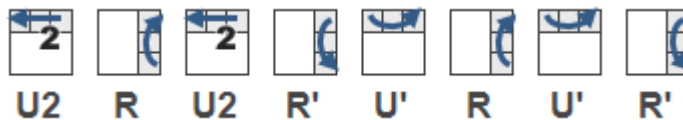


- 2) You will have "Sune" (layer 3 yellow facing you) or "Antisune" (layer 3 yellow corner on right) with the one top corner yellow on right.



Sune and antisune

- a. If Sune, repeat algo #9 above
- b. If Antisune, do algo #10 below



- 3) Goal: This will make top all yellow

STEP 6: Finishing the puzzle

- 1) Find headlights (solid bar also considered a headlight)



- 2) Perform algo #11 below with headlights in back (or if no headlights, perform on any side with yellow on top)



- a. You should now have headlights on all sides

- 3) Rotate cube so headlights match up with other colors on the face.
- 4) If you have a full headlights (line), put in back and solve algo #12 below
 - a. If not solved, put line in back + try algo #12 below again
 - b. If no solved bar / line, do algo #12 below

