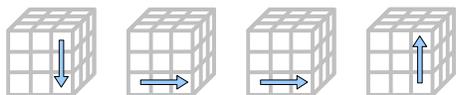


The Most Concise Understandable Solution to Rubik's Cube Ever. By Dan Knights.

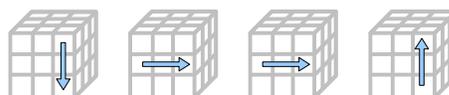
Introduction. The solution uses just 4 permutations derived from this basic concept: “turn a vertical layer, double turn a horizontal layer, then un-turn the vertical layer,” and that fact that each variant is its own inverse.

The Permutations.

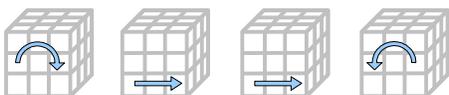
C_R (Removes/Replaces top-front-right corner)



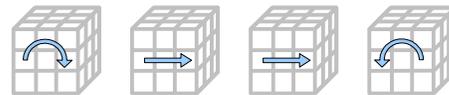
E_R (Removes/Replaces top-right edge)



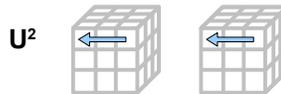
C_F (Removes/Replaces top-front-right corner, mirror)



E_F (Removes/Replaces top-front edge, mirror)



Also, U refers to the “upper” layer:



The Solution. In steps 2 and 4, you may turn the top layer freely before applying a permutation. The permutations given below must be applied several times to solve certain cases in steps 3-6.

1. Solve the bottom layer on your own.
2. Solve the 4 “equator” layer edges.
 - a. $E_R U^{-1} E_R$ puts the *top-front* edge in the *back-left* position (with its “top” color in back).
 - b. $E_F U E_F$ puts the *top-right* edge in the *back-left* position (with its “top” color on the left).
3. Get the 4 top corners all one color on top, ignoring their sides.
 - a. $C_R C_F U C_F C_R$ twists the *top-front-right* corner anti-clockwise, and the *top-back-right* one clockwise.
4. Put the 4 top corners in the right places.
 - a. $C_R U C_R U C_R U^2 C_R$ permutes *top-front-right*→*top-back-right*→*top-back-left*→*top-front-right*
5. Get the 4 top edges all one color on top, ignoring their sides.
 - a. $E_R U^{-1} E_F U E_F E_R$ twists the *top-front* and *top-right* edges.
6. Put the 4 top edges in the right places.
 - a. $E_R U E_R U E_R U^2 E_R$ permutes *top-right*→*top-back*→*top-left*→*top-right*

Improvements. You may also modify permutations as you begin to understand them. For example:

- a. in step 3, $C_R C_F U^2 C_F C_R$ twists the *top-front-right* and *top-back-left* corners.
- b. in step 5, $E_R E_F U^{-1} E_F U E_R$ twists the *top-left* and *top-right* edges.
- c. $C_R U^2 C_R U^{-1} C_R U^{-1} C_R$ performs the inverse of the permutation in step 4 above.