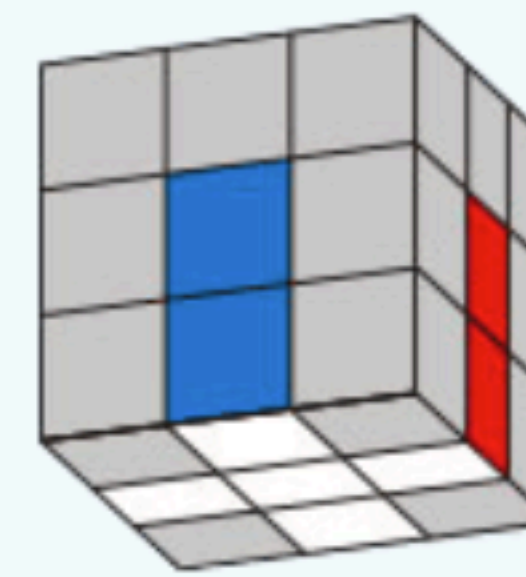# 1 | Build a white cross

The side colors of the cross should the color of the center pieces

STEP1 Find these edge pieces with the following colors white red, white blue, white orange, white green and ignore those without white The diagram below indicates different situations find the matched case and execute the movem- ent according to it, in order to put the white side next to the yellow center.

STEP2 Turn the top layer to match every cross piece one by one, turn 180° to matched down white center pieces. Repeat this step until all the cross pieces are in the right place.
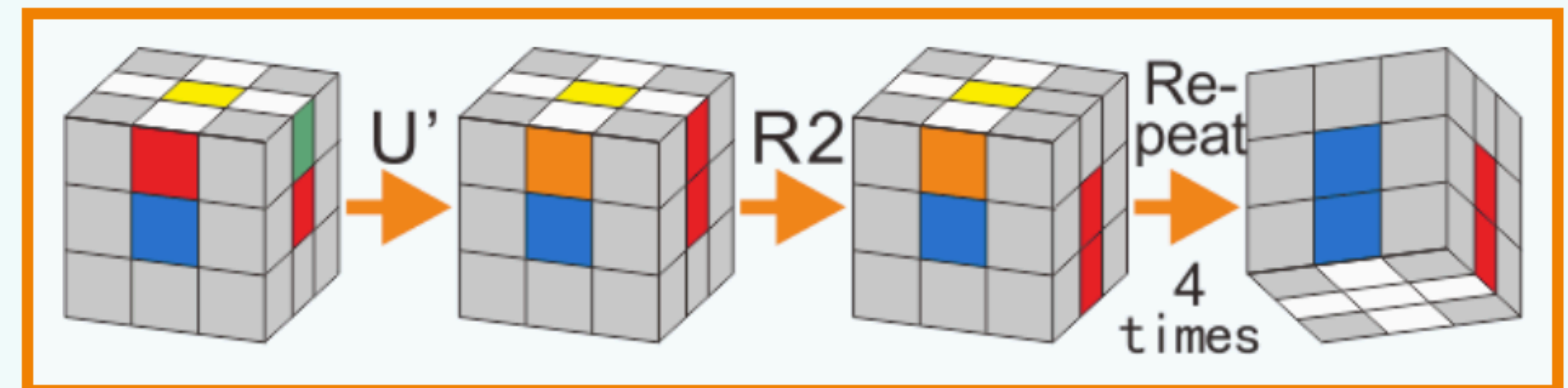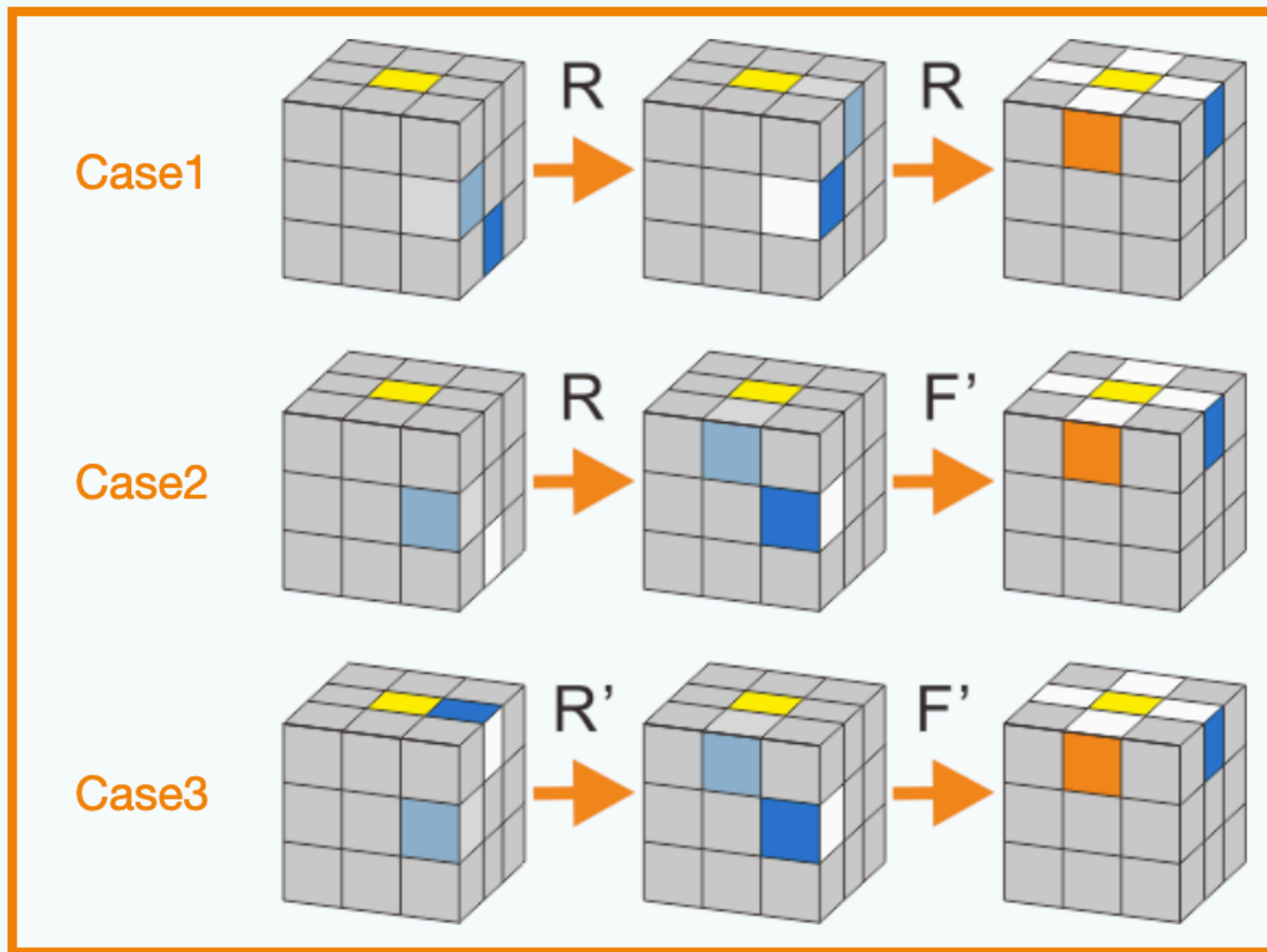
📄 Cross is actually pretty easy. if you can solve one side you can solve cross too. Do brainstorming:)

Case1

R → R →

Case2

R → F' →

Case3

R' → F' →

Tips

📄 The gray represents the unnecessary part in this step

📄 The translucent area rep-resents the final position af-ter executing the movemen

📄 If there's already white edge on the top layer, hide it first and then keep solving for the Cross

U →
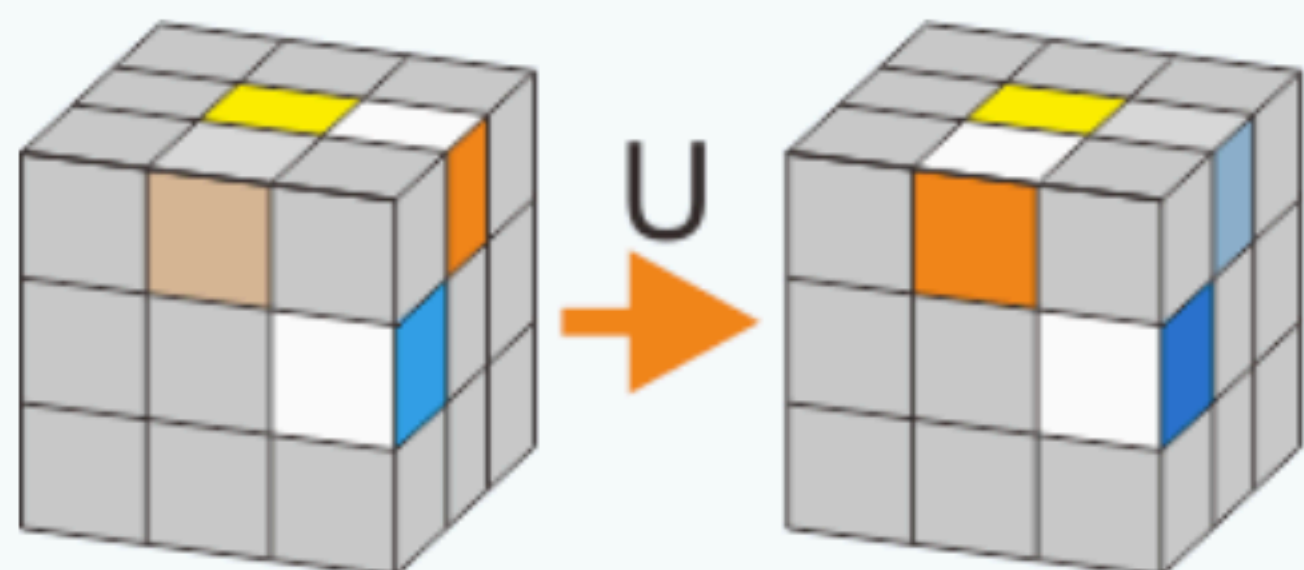
2 Solve the four corners

The whole white side will solve, and the sides will be, T-shaped upside down.

STEP1 Find white corner pieces at the to player, and put that corner on top of the matched position. In this example, the white red blue corner is matching with the red and blue centers.
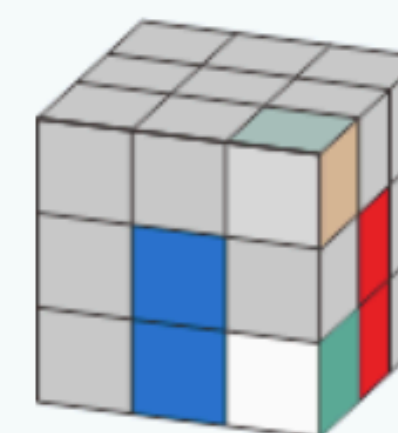
STEP2 Execute the right algorithm according to the situations shown in the diagram below.

STEP3 Repeat this step until all four corners are solved.

U or U' or U2

STEP 1

R U R'
Algorithm1

U R U' R'
Algorithm2

R U' R'
U2 R U R'
Algorithm3

STEP 2

STEP 3
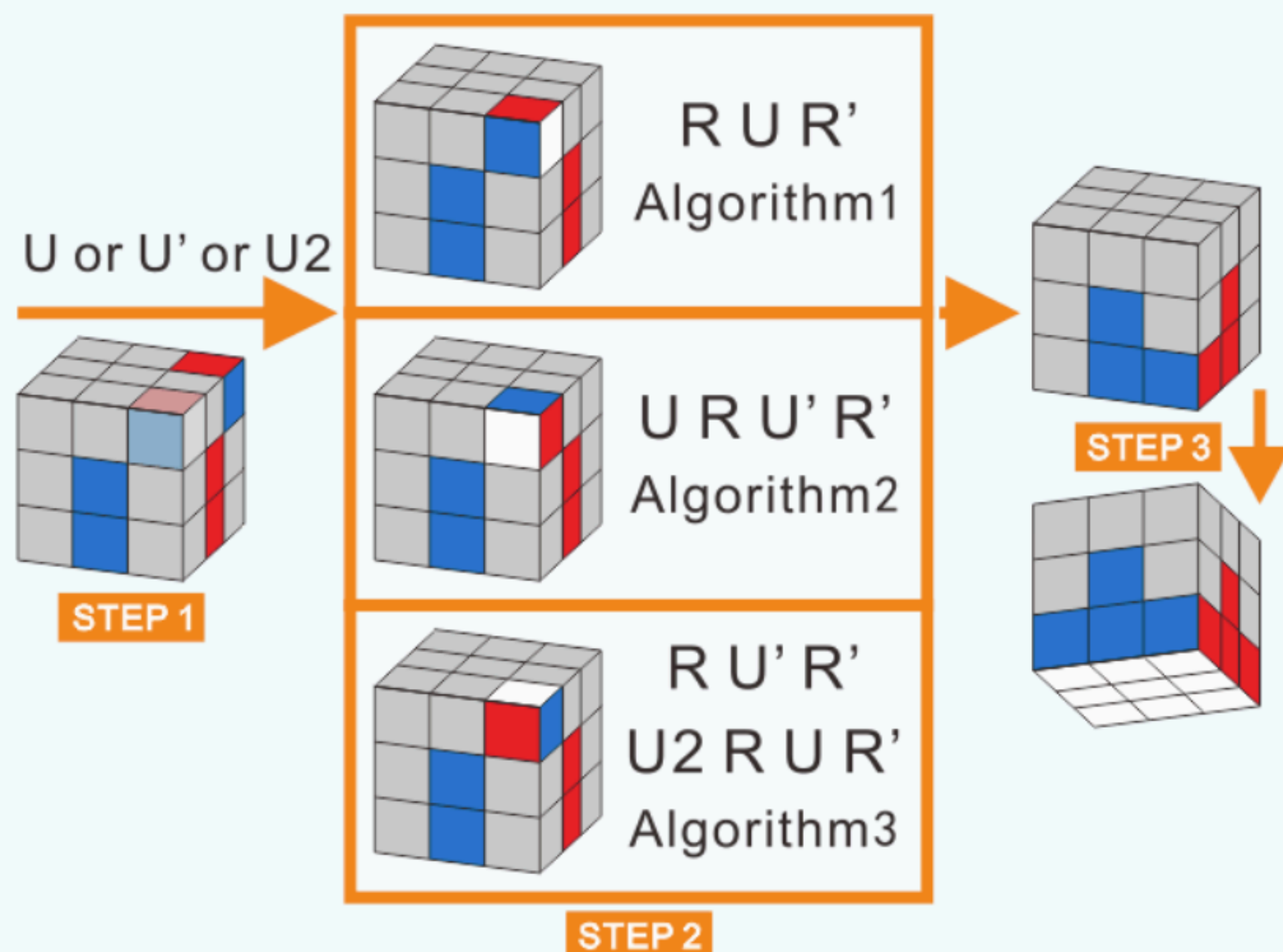
Tips

If there are no white corner pieces in the top layer, then execute RU'R' or RUR'. Like this case, the green orange white corner piece will place on the top side. After executing the algorithm, it could be solved by following the instruction
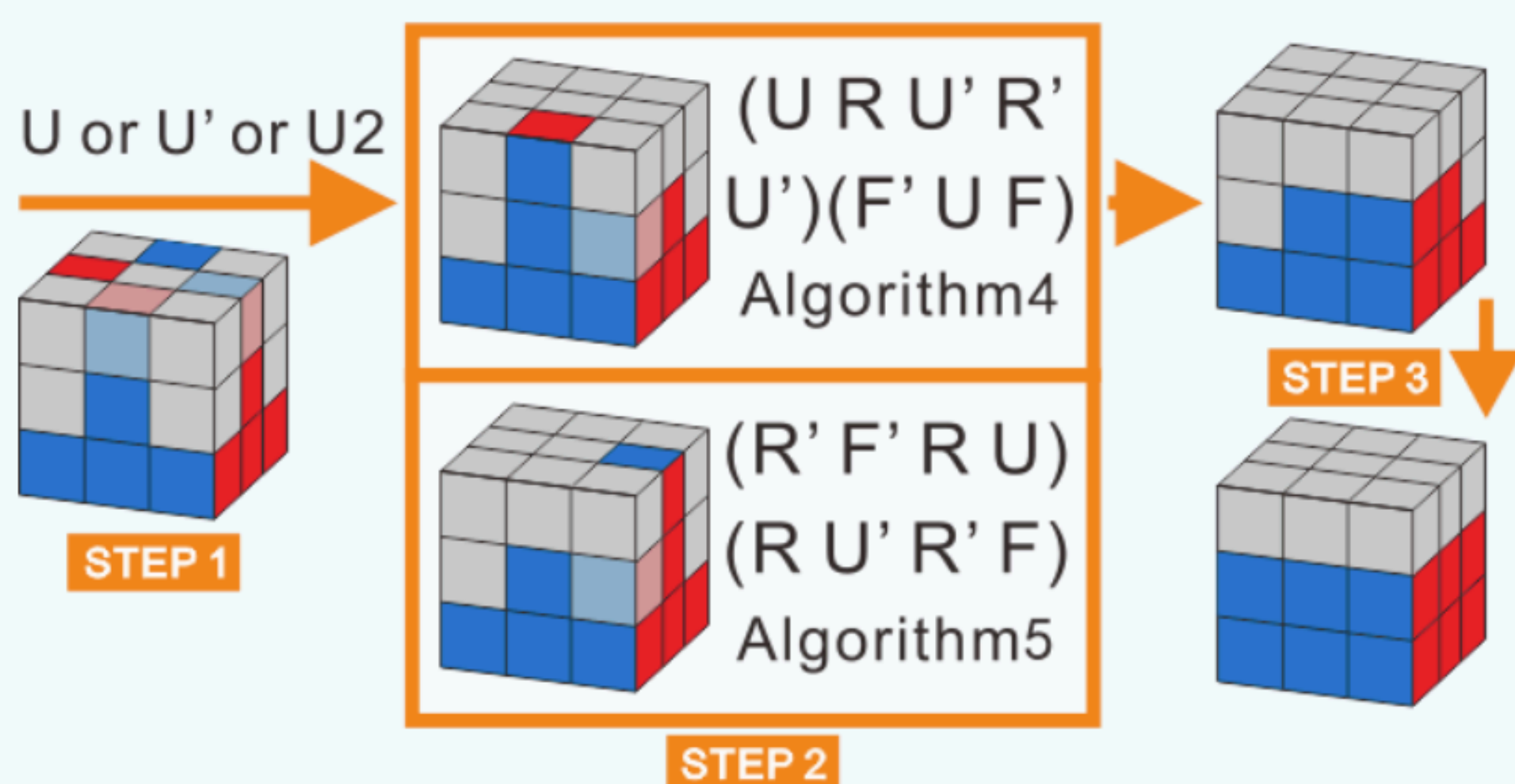
3 Solve the four middle edge pieces

The first two layers will be solved.

STEP1 Find the edge which is not with yellow, and match its side color

STEP2 Execute the right algorithm according to the situations shown in the diagram below.

STEP3 Repeat this step until two layers will be solved.

U or U' or U2

STEP 1

(U R U' R' U')(F' U F)
Algorithm4

(R' F' R U)
(R U' R' F)
Algorithm5

STEP 2

STEP 3

Tips

If there are no right pieces in the top layer execute the above algorithms in this step, like (R'F'RU)(RU'R'F) Like this case, the green orange edge will replace by the top layer, and then follow the instruction to solve

The ( ) in the algorithm only contributes with better fingertricks, and helps with the memorization, which will not affect the turning of the algorithm.
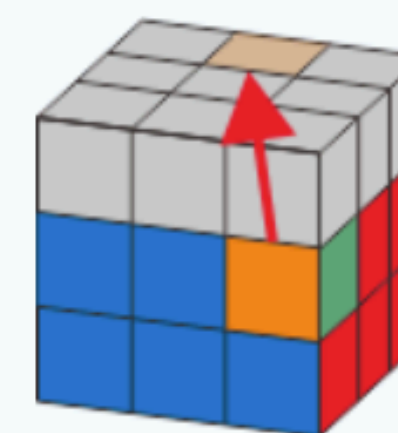
4 | Adjust the four top edges' side

It will build up a yellow cross on the top layer.

- This step only requires the yellow side of the top , the other sides could be ignored.
- There are only four cases in this step, which execute the Algorithm 6 once wil I transform to the next case, until the yellow cross is done.
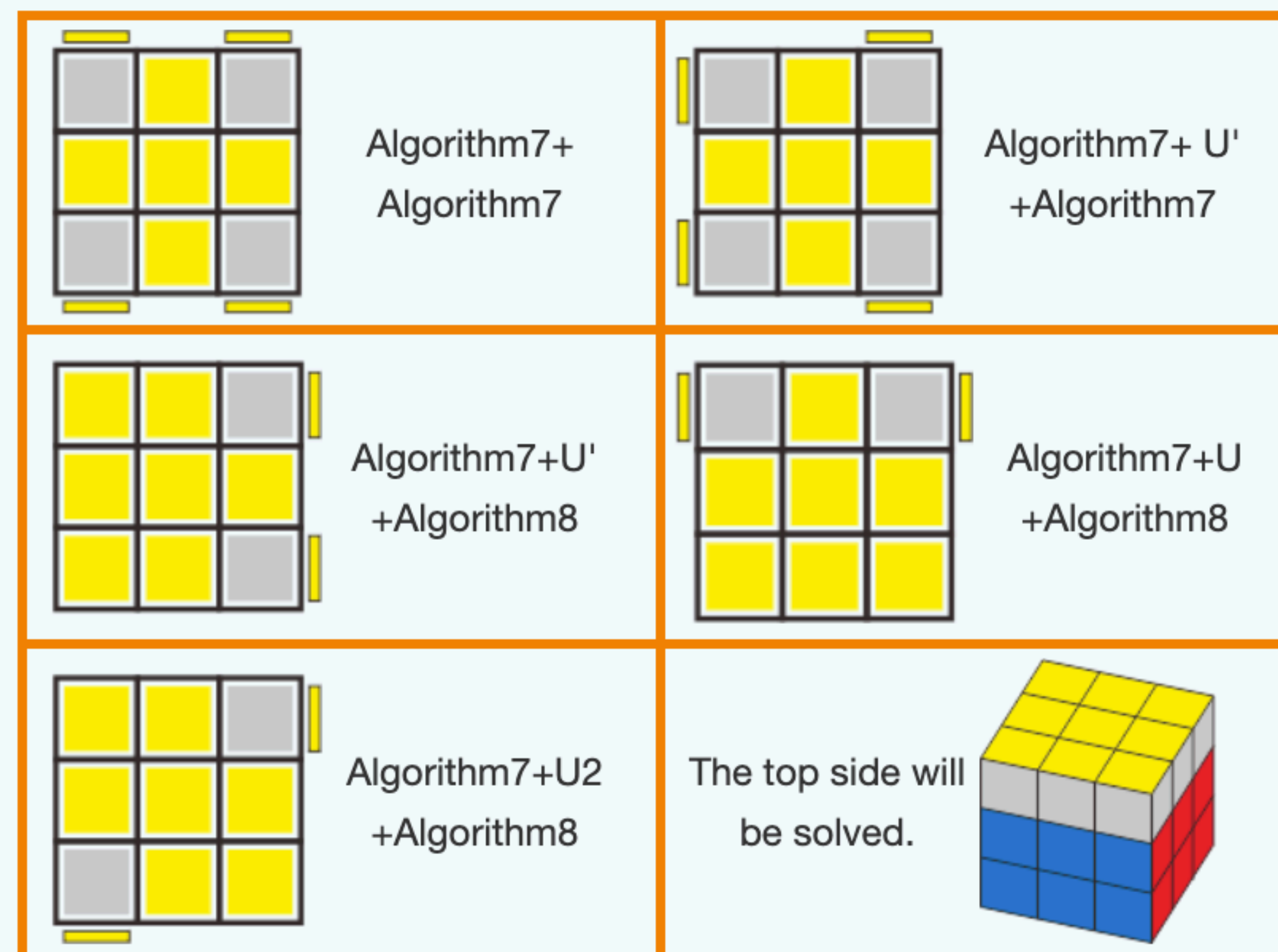

F(R U R' U')F' Algorithm6
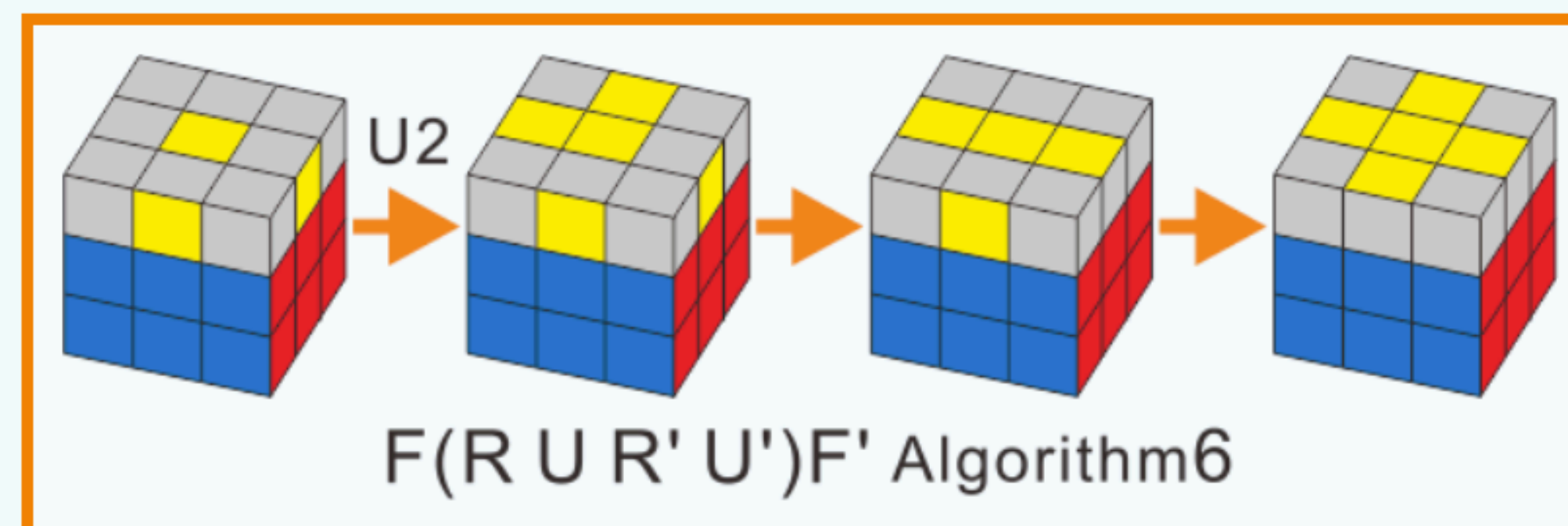
5 | Adjust the four top corners' side

The whale yellow side will be salved.

- The diagram is vertical view, and the yellow bars represent the vel low pieces on the sides.
- Focus on top side, and there are 7 cases for total. The cases which only have one yellow corner on the top side just need to execute the algorithm once.

(R U2)(R' U'R U'R') Algorithm7

(R U R'U)(R U2 R') Algorithm8

- The other 5 cases require two algorithms7.

Algorithm7+ Algorithm7

Algorithm7+ U' +Algorithm7

Algorithm7+U' +Algorithm8

Algorithm7+U +Algorithm8

Algorithm7+U2 +Algorithm8

The top side will be solved.

Tips

- Make sure to adjust to the right position before executing the algorithm.
- In Step4/5/7, if the first two layers was solved, the case is not included in the instruction, such as eight yellow pieces on the Cop side, or only two edges need to switch. These situations indicate that the cube is assembled in-correctly, which have to reassemble to the solved state.

CFOP vs. Beginner method

- CFOP's algorithms are way more than the beginner method, except for the Cross. Cross does not really need algorithms, as it can be solved by experience within 8 steps.
- In CFOP ,the F2L (First Two Layers) combines Stel2 and 3, which a pair of corner and edge can be done by only one algorithm, with twice efficiency.
- CFOP can directly solve the cases in Step 4 by only one algorithm OLL combines Step 4 and 5, and PLL combines Step 6 and 7, efficient by 200%.
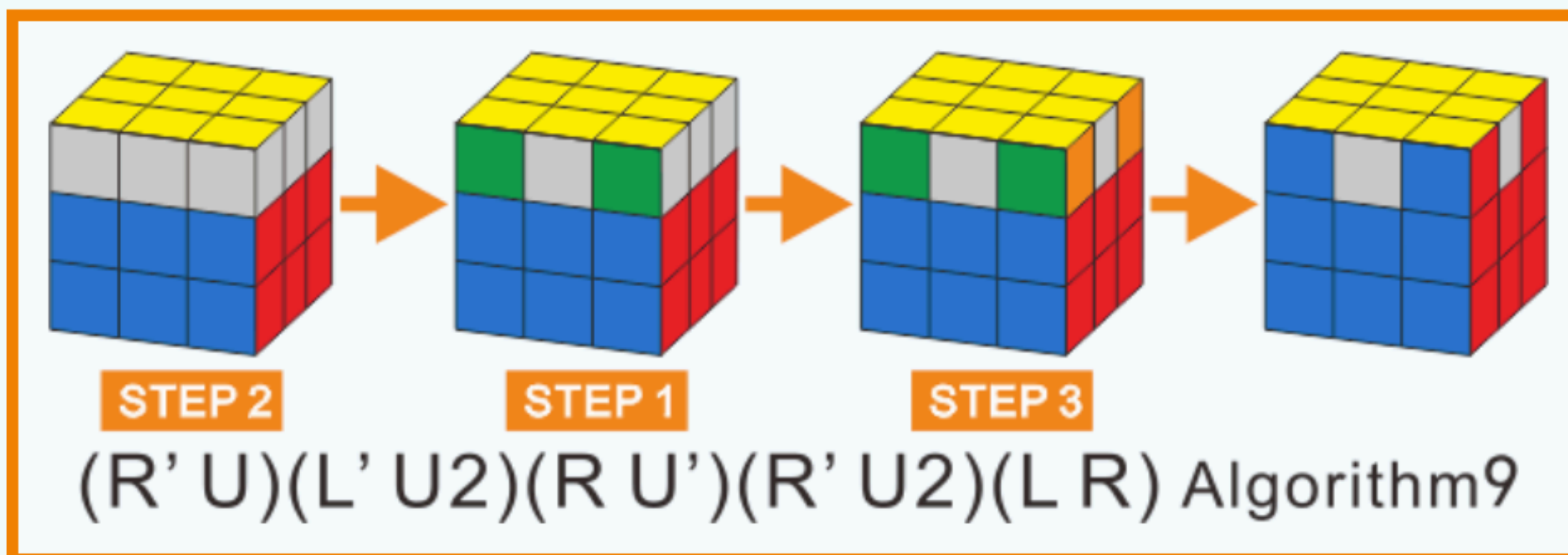
6 Permute the four corners
All the corners will be solved

STEP1 Find the corners with the same color on the sides, and then execute Algorithm 9. If all the corners are placed correctly, then skip to Step 3.
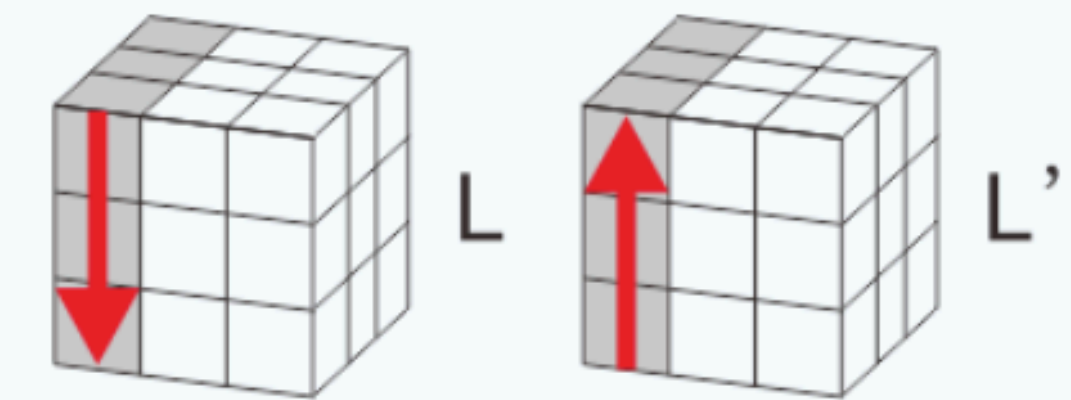
STEP2 If none of the corners are placed correctly, execute Algorithm 9 once, and look for a pair of the corner, then executeAlgorithm 9 once again.

STEP3 Match the corners with the color of the first 2 layers bydoing U layermove

STEP 2 → STEP 1 → STEP 3

(R' U)(L' U2)(R U')(R' U2)(L R) Algorithm9

Tips

The principle of Algorithm 9 is exchange the position of left and right rear comers.

L   L'

Pay attention to the direction of L and L.

7 Permute the four edges
You will conquervour Rubik's Cube all sixsidesl!

The diagram is vertical view. The arrows represent the moving direction of the edge pieces, and the black bars representthe same-colored pieces.

Tips

M is the movement of middle laver.It could be done by either index finger or ring finger pushing. M'could be done by ring finger move

M   M'

M'2 U M U2 M' U M'2
Algorithm10

Algorithm10+
Algorithm10

Algorithm10+U+
Algorithm10+U'

Algorithm10+U'
+Algorithm10+U