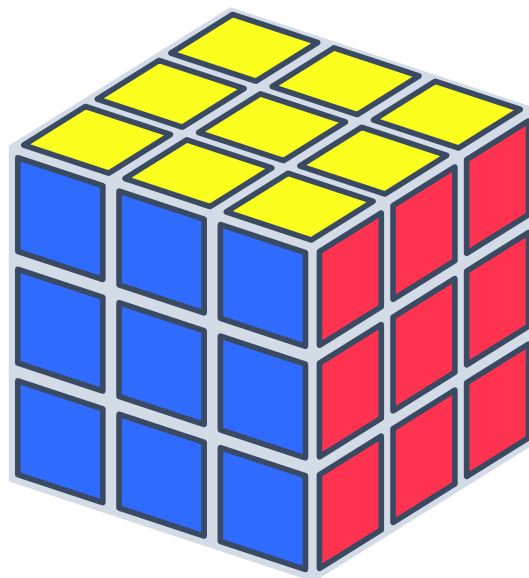




BEGINNER'S METHOD

RUBIK'S CUBE 3x3 · LAYER BY LAYER · 7 STEPS



PRINTABLE GUIDE · FROM SCRAMBLED TO SOLVED

Seven steps, each with its algorithms drawn move by move: the cube exactly as it is before each turn, the letter and the arrow.
White cross on the bottom · blue in front · red on the right.



HOW TO READ THIS GUIDE

HOLDING THE CUBE

Hold the cube with the WHITE centre on the bottom (yellow on top), BLUE in front and RED on the right. The centres never move: they tell you the final colour of each face. The drawings always show those three faces (top, front and right) except the ones marked "seen from below". When a step says "turn the cube", turn the whole cube about the vertical axis: white stays at the bottom and the faces change names.

THE COLOURS ARE AN EXAMPLE

The drawings have blue in front and red on the right as an example: you can put any side face in front. What counts is white on the bottom, yellow on top and where each piece sits relative to the centres.

COLOURS



THE THREE KINDS OF PIECES



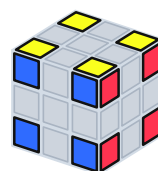
CENTRES • 6

One per face, one colour. They never move relative to each other: the centre tells you the face's final colour.



EDGES • 12

Two colours. Steps 1, 3, 4 and 7 place edges.



CORNERS • 8

Three colours. Steps 2, 5 and 6 place corners. A piece never changes kind.

WHAT EACH STICKER MEANS



PIECE OF THE STEP

The pieces this step moves: full colour, black outline.



ALREADY SOLVED

What you solved in earlier steps; it must not move.



DOESN'T MATTER YET

On your cube it can be any colour: ignore it.

Steps 4 and 5 follow the OLL convention: only the YELLOW stickers of the last layer are coloured; the rest are grey because their position doesn't matter yet.

EACH CASE

1. CASE: how the cube must look before you start. If yours doesn't match, turn the top layer (U) or the whole cube until it does: the algorithms only work from the position drawn.
2. One box per move, in order: the cube exactly as it is BEFORE that move, the letter, the little cube with the turning layer in white and the pink arrow showing the direction.
3. END: the result. If it's an intermediate stage (a cross, one corner) the step goes on with the next piece.

GOLDEN RULE

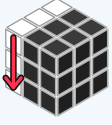
Do an algorithm all the way through, without stopping to look: if you get lost halfway, the cube ends up a mess. Practise each one with a solved cube in your hands until it comes from memory; the face in front doesn't change during the whole algorithm.

NOTATION

THE SIX FACES



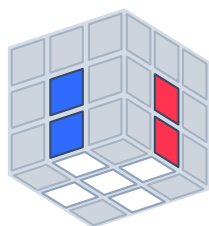
Each letter is a face: U up, D down, R right, L left, F front and B back. The letter on its own is a quarter turn clockwise AS YOU LOOK STRAIGHT AT THAT FACE; with an apostrophe (') it's the opposite turn and with 2 a half turn. On each little cube the turning layer is white.

 U	 U'	 U2
 D	 D'	 D2
 R	 R'	 R2
 L	 L'	 L2
 F	 F'	 F2
 B	 B'	 B2

A trick for R and L: both move the column in front of you up or down. R goes up, R' down; L goes down, L' up. U and D work the same way: U moves the front row to the left, D to the right. B hardly appears in this method (only B2, where the direction doesn't matter).

THE METHOD IN 7 STEPS

LAYER BY LAYER

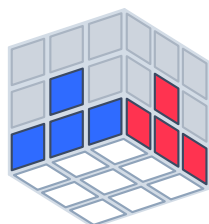


1 THE WHITE CROSS

seen from below

F2 U R2 U2 B2 U L2

p.5

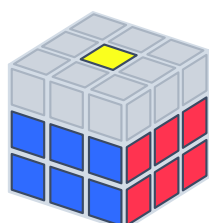


2 THE WHITE CORNERS

seen from below

R U R' U'
F' U' F
R U2 R' U' R U R'

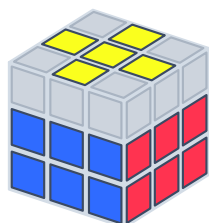
p.6



3 THE SECOND LAYER

U R U' R' U' F' U F
U' L' U L U F U' F'

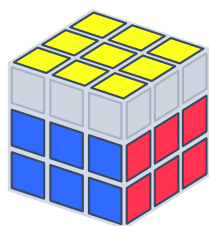
p.8



4 THE YELLOW CROSS

F R U R' U' F'
F U R U' R' F'
F R U R' U' F' U2 F U R U' R' F'

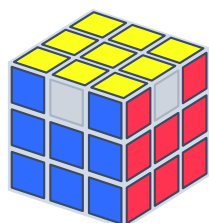
p.10



5 THE YELLOW FACE

R U R' U R U2 R'

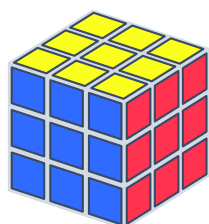
p.13



6 PERMUTE THE CORNERS

R U R' U' R' F R2 U' R' U' R U R' F'

p.15



7 PERMUTE THE EDGES

R U' R U R U R U' R' U' R2
R2 U R U R' U' R' U' R' U R'

p.16

STEP 1 THE WHITE CROSS



STEP 1 OF 7

Goal: the four white edges on the bottom face, each with its other colour right under the centre of that colour. It takes two stages: first the DAISY (four white petals around the yellow centre, on top), then each petal goes down to its place with a half turn.



HOLD IT LIKE THIS

yellow on top

white at the bottom

blue: facing you

red on the right

example colours

1 • THE DAISY

CASE



THE DAISY

WHITE PETALS UP

Bring the four edges that have white to the top layer, with the white facing the sky. It is the only part without an algorithm: turn the side faces to lift each edge and, if that would break a petal already in place, first turn the top layer (U) to move it out of the way. White edges in the middle layer come up with one turn of the side face; those at the bottom, with a half turn. The other colours don't matter yet: on your cube the grey pieces can be any colour.

2 • DAISY TO CROSS

F2

U

R2

U2

B2

U

L2

7 MOVES

Turn the top layer until a petal's side colour matches the centre of its face, then give that face a half turn: the petal drops into place. Repeat with the other three; the ones already down stay put because you only turn the top layer and do half turns.

CASE



DAISY TO CROSS

1



F2

FRONT • HALF TURN

2



U

TOP LAYER • LEFT

3



R2

RIGHT LAYER • HALF TURN

4



U2

TOP LAYER • HALF TURN

5



B2

BACK LAYER • HALF TURN

6



U

TOP LAYER • LEFT

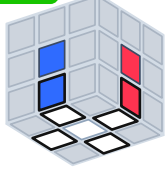
7



L2

LEFT LAYER • HALF TURN

END



WHITE CROSS

SEEN FROM BELOW

STEP 2 THE WHITE CORNERS



STEP 2 OF 7

Goal: the four white corners, completing the first layer. Find a corner with white in the top layer and turn U until it sits above its slot: the one between the centres of its other two colours. Turn the whole cube so that slot is at the front right and look where the white sticker points.



HOLD IT LIKE THIS



yellow on top



white at the bottom



blue: facing you



red on the right

example colours

A • WHITE FACING RIGHT

R

U

R'

U'

4 MOVES

CASE

WHITE FACING RIGHT

1

R

RIGHT LAYER • UP

2

U

TOP LAYER • LEFT

3

R'

RIGHT LAYER • DOWN

4

U'

TOP LAYER • RIGHT

END

CORNER IN
FROM BELOW

B • WHITE FACING FRONT

F'

U'

F

3 MOVES

CASE

WHITE FACING FRONT

1

F'

FRONT • COUNTER-CLOCKWISE

2

U'

TOP LAYER • RIGHT

3

F

FRONT • CLOCKWISE

END

CORNER IN
FROM BELOW

STEP 2 THE WHITE CORNERS



STEP 2 OF 7 · CONTINUED

C · WHITE FACING UP

R U2 R' U' R U R'

7 MOVES

CASE

WHITE FACING UP

1

R
RIGHT LAYER · UP

2

U2
TOP LAYER · HALF TURN

3

R'
RIGHT LAYER · DOWN

4

U'
TOP LAYER · RIGHT

5

R
RIGHT LAYER · UP

6

U
TOP LAYER · LEFT

7

R'
RIGHT LAYER · DOWN

END

CORNER IN
FROM BELOW

WHITE CORNER STUCK AT THE BOTTOM

If a white corner is in the bottom layer but in the wrong slot or twisted, put it at the front right and do R U R' U': it comes up to the top layer and you start again with it. In fact, repeating just R U R' U' also solves all three cases (once for A, three times for C and five for B); algorithms B and C are the shortcut.

STEP 3 THE SECOND LAYER



STEP 3 OF 7

Goal: the four middle-layer edges (the ones with neither white nor yellow). Find an edge without yellow on top, turn U until its side colour matches the centre of that face and put that face in front. The edge's top colour tells you where it goes: if it matches the right centre, to the right; if it matches the left centre, to the left.



HOLD IT LIKE THIS

yellow on top

white at the bottom

blue: facing you

red on the right

example colours

A • INSERT RIGHT

U R U' R' U' F' U F

8 MOVES

CASE

INSERT RIGHT

1

U
TOP LAYER • LEFT

2

R
RIGHT LAYER • UP

3

U'
TOP LAYER • RIGHT

4

R'
RIGHT LAYER • DOWN

5

U'
TOP LAYER • RIGHT

6

F'
FRONT • COUNTER-CLOCKWISE

7

U
TOP LAYER • LEFT

8

F
FRONT • CLOCKWISE

END

EDGE IN

STEP 3 THE SECOND LAYER



STEP 3 OF 7 · CONTINUED

B · INSERT LEFT

U' L' U L U F U' F'

8 MOVES

CASE  INSERT LEFT	1  U'  TOP LAYER · RIGHT	2  L'  LEFT LAYER · UP	3  U  TOP LAYER · LEFT	4  L  LEFT LAYER · DOWN
5  U  TOP LAYER · LEFT	6  F  FRONT · CLOCKWISE	7  U'  TOP LAYER · RIGHT	8  F'  FRONT · COUNTER-CLOCKWISE	END  EDGE IN

EDGE STUCK IN THE MIDDLE LAYER

If no edge without yellow is left on top but the middle layer isn't complete, some edge is in its slot but flipped, or in another edge's slot. Put that slot at the front right and do algorithm A with any top edge: the stuck one comes up and you insert it again.

STEP 4 THE YELLOW CROSS



STEP 4 OF 7

Goal: the four yellow edges facing up. It doesn't matter yet whether they are in place, nor do the corners (that's why they are grey). Look only at the edges of the top face: you'll see a DOT (no yellow), an L (two neighbouring yellows), a LINE (two opposite) or the cross already done. Hold the cube exactly as in the drawing before you start.



HOLD IT LIKE THIS

yellow on top

white at the bottom

blue: facing you

red on the right

example colours

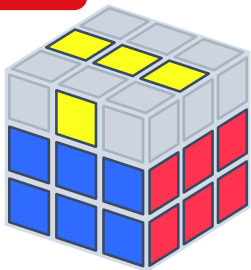
A • LINE

F R U R' U' F'

6 MOVES

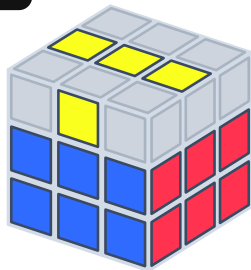
The line horizontal, from left to right.

CASE



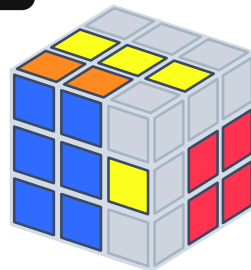
LINE

1



FRONT • CLOCKWISE

2



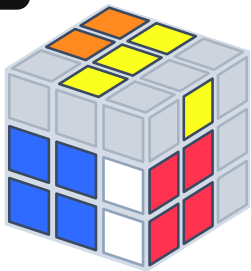
RIGHT LAYER • UP

3



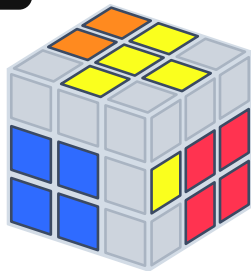
TOP LAYER • LEFT

4



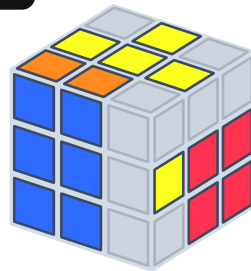
RIGHT LAYER • DOWN

5



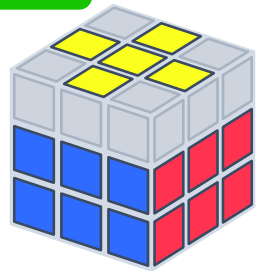
TOP LAYER • RIGHT

6



FRONT • COUNTER-CLOCKWISE

END



YELLOW CROSS

STEP 4 THE YELLOW CROSS



STEP 4 OF 7 · CONTINUED

B · L SHAPE

F U R U' R' F'

6 MOVES

The L points back and to the left (at nine and twelve o'clock).

CASE

L SHAPE

1

F

FRONT · CLOCKWISE

2

U

TOP LAYER · LEFT

3

R

RIGHT LAYER · UP

4

U'

TOP LAYER · RIGHT

5

R'

RIGHT LAYER · DOWN

6

F'

FRONT · COUNTER-CLOCKWISE

END

YELLOW CROSS

STEP 4 THE YELLOW CROSS



STEP 4 OF 7 · CONTINUED

C · DOT

F R U R' U' F' U2 F U R U' R' F'

13 MOVES

It's A and B in a row: the first makes an L, U2 moves it to the back left and the second closes the cross.

CASE DOT	1 F FRONT · CLOCKWISE	2 R RIGHT LAYER · UP	3 U TOP LAYER · LEFT	4 R' RIGHT LAYER · DOWN
5 U' TOP LAYER · RIGHT	6 F' FRONT · COUNTER-CLOCKWISE	7 U2 TOP LAYER · HALF TURN	8 F FRONT · CLOCKWISE	9 U TOP LAYER · LEFT
10 R RIGHT LAYER · UP	11 U' TOP LAYER · RIGHT	12 R' RIGHT LAYER · DOWN	13 F' FRONT · COUNTER-CLOCKWISE	END YELLOW CROSS

STEP 5 THE YELLOW FACE



STEP 5 OF 7

Goal: the whole top face yellow. A single algorithm, the SUNE, solves every case; the only thing that changes is how you hold the cube. Count how many corners have yellow on top and compare with the drawings; the edges are already right, and the corners' side stickers are grey except the yellow ones.



HOLD IT LIKE THIS

yellow on top

white at the bottom

blue: facing you

red on the right

example colours

FISH • SUNE (OLL 27)

R U R' U R U2 R'

7 MOVES

Only one corner with yellow on top, at the front left, and a yellow facing you on the front-right corner.

CASE

FISH • SUNE (OLL 27)

1

R
RIGHT LAYER • UP

2

U
TOP LAYER • LEFT

3

R'
RIGHT LAYER • DOWN

4

U
TOP LAYER • LEFT

5

R
RIGHT LAYER • UP

6

U2
TOP LAYER • HALF TURN

7

R'
RIGHT LAYER • DOWN

END

YELLOW FACE

STEP 5 THE YELLOW FACE



STEP 5 OF 7 · CONTINUED

NOT THIS FISH? HOLD IT LIKE THIS AND DO A SUNE

0 UP → SUNE →

No yellow corner on top: hold it with a yellow facing LEFT on the front-left corner (on the left face, which the drawing doesn't show).

2 UP → SUNE →

Two corners up: hold it with a yellow FACING YOU (front face) on the front-left corner.

FISH THE OTHER WAY → SUNE →

Yellow corner at the front left but no yellow facing you on the right: one Sune turns it into the fish above.

After each Sune, count again and hold the cube by the rule. You never need more than three.

THE SEVEN POSSIBLE CASES

OLL 21-27 · SUNES NEEDED WITH THE RULE

OLL 21

H
2 SUNES

OLL 22

PI
2 SUNES

OLL 23

HEADLIGHTS
3 SUNES

OLL 24

T
3 SUNES

OLL 25

BOWTIE
3 SUNES

OLL 26

ANTI-SUNE
2 SUNES

OLL 27

SUNE
1 SUNE

With the yellow cross done, the corners can only be in one of these seven ways (cases 21 to 27 of the OLL series, where each has its own direct algorithm). Below each, how many Sunes it takes following the rule above.

STEP 6 PERMUTE THE CORNERS



STEP 6 OF 7

Goal: every top corner in place, its three colours matching the three centres around it. Look for HEADLIGHTS: two neighbouring corners with the same colour on a side face. Hold the cube with the headlights on the LEFT and apply the algorithm: the two right-hand corners swap. If there are no headlights, apply it once from any side and they'll appear. When done, turn U until the corners match the centres.



HOLD IT LIKE THIS

yellow on top

white at the bottom

blue: facing you

red on the right

example colours

HEADLIGHTS ON THE LEFT • T PERM

R U R' U' R' F R2 U' R' U' R U R' F'

14 MOVES

The headlights are on the left face, which the drawing doesn't show: what you can see is that the front-left corner already matches its centres and the two on the right don't. Those two swap. The top edges move too: it doesn't matter, they are placed in step 7.

CASE HEADLIGHTS ON THE LEFT • T PERM	1 R RIGHT LAYER • UP	2 U TOP LAYER • LEFT	3 R' RIGHT LAYER • DOWN	4 U' TOP LAYER • RIGHT	5 R' RIGHT LAYER • DOWN
6 F FRONT • CLOCKWISE	7 R2 RIGHT LAYER • HALF TURN	8 U' TOP LAYER • RIGHT	9 R' RIGHT LAYER • DOWN	10 U' TOP LAYER • RIGHT	11 R RIGHT LAYER • UP
12 U TOP LAYER • LEFT	13 R' RIGHT LAYER • DOWN	14 F' FRONT • COUNTER-CLOCKWISE	END CORNERS PLACED		

STEP 7 PERMUTE THE EDGES



STEP 7 OF 7

Goal: the last edges. With the corners matching the centres, usually one edge is already right: hold the cube with that edge at the BACK. Look at the front edge: its side colour tells you which face it has to go to, left or right. If no edge is right, do either algorithm once, one will end up right, and look again.



HOLD IT LIKE THIS

yellow on top

white at the bottom

blue: facing you

red on the right example colours

A • FRONT EDGE GOES RIGHT • Ua PERM

R U' R U R U R U' R' U' R2

11 MOVES

The front edge carries the right face's colour; the back one is already right (not visible in the drawing).

CASE FRONT EDGE GOES RIGHT • Ua PERM	1 R RIGHT LAYER • UP	2 U' TOP LAYER • RIGHT	3 R RIGHT LAYER • UP	4 U TOP LAYER • LEFT
5 R RIGHT LAYER • UP	6 U TOP LAYER • LEFT	7 R RIGHT LAYER • UP	8 U' TOP LAYER • RIGHT	9 R' RIGHT LAYER • DOWN
10 U' TOP LAYER • RIGHT	11 R2 RIGHT LAYER • HALF TURN	END SOLVED		

STEP 7 PERMUTE THE EDGES



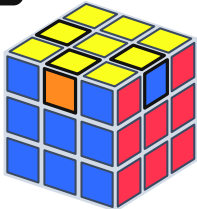
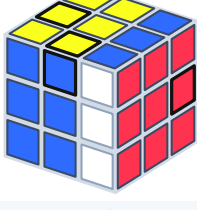
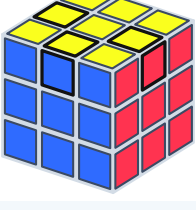
STEP 7 OF 7 · CONTINUED

B · FRONT EDGE GOES LEFT · Ub PERM

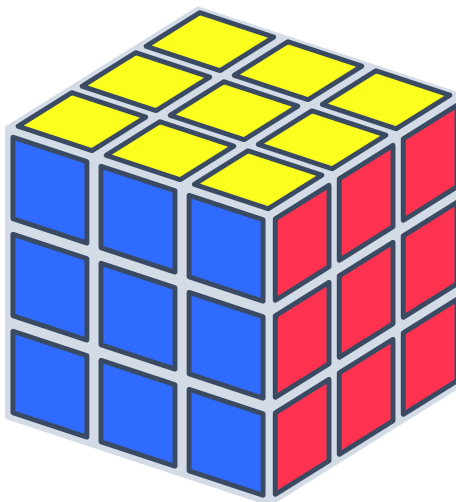
R2 U R U R' U' R' U' R' U R'

11 MOVES

The front edge carries the left face's colour; the back one is already right.

CASE  FRONT EDGE GOES LEFT · Ub PERM	1  R2  RIGHT LAYER · HALF TURN	2  U  TOP LAYER · LEFT	3  R  RIGHT LAYER · UP	4  U  TOP LAYER · LEFT
5  R'  RIGHT LAYER · DOWN	6  U'  TOP LAYER · RIGHT	7  R'  RIGHT LAYER · DOWN	8  U'  TOP LAYER · RIGHT	9  R'  RIGHT LAYER · DOWN
10  U  TOP LAYER · LEFT	11  R'  RIGHT LAYER · DOWN	END  SOLVED		

SOLVED! WHAT NEXT?



FROM BEGINNER TO CFOP

Once you can do this method without the guide, the next step is CFOP (Fridrich), the speedcubers' method. Each of its steps replaces two of these:

- CROSS: the white cross directly, without the daisy, planned before you start.
- F2L: each white corner together with its edge (steps 2 and 3 at once). 41 cases, with their own guide and video series.
- OLL: the whole yellow face at once (steps 4 and 5 together): 57 cases, one per video. You already know the Sune.
- PLL: corners and edges in one go (steps 6 and 7 together): 21 cases. You already know three: the T and both Us.

TIPS TO GET FASTER

1. Learn to look while you turn: plan the next piece during the current algorithm.
2. Don't put the cube down to re-grip it; in steps 2 and 3 practise bringing the piece to the front with U only.
3. Learn the mirrors of the algorithms (the L version of each R one) so you don't have to turn the cube around.
4. Time yourself once per session, not on every try: your time drops with repetition alone.

MORE GUIDES AND VIDEOS

The "F2L · all 41 cases" guide and the F2L and OLL short-video series use the same orientation, colours and arrows as this booklet, so you can follow them without learning the notation again. More at levelcero.com.

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