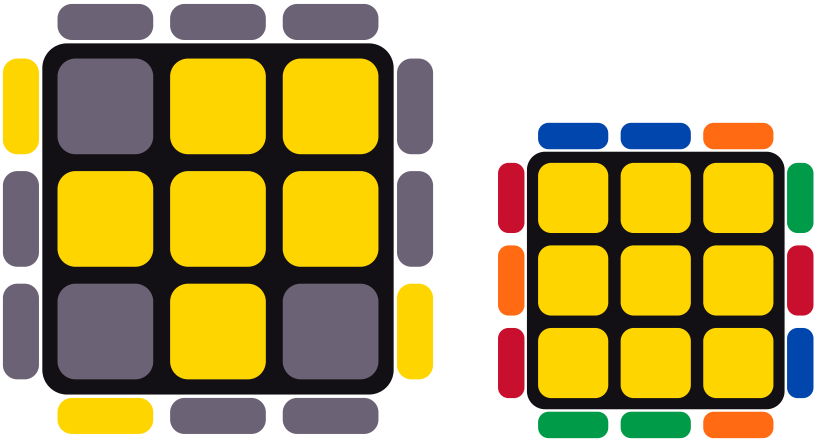
Cube Lab

PRINTABLE GUIDE

CFOP: 2-look OLL & PLL

A cheat sheet for the last layer: 16 algorithms.



1. What CFOP is
2. 2-look OLL
3. 2-look PLL
4. AUF and finger tricks

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CFOP (SPEEDSOLVING)

What CFOP is

CFOP is the method most speedsolvers use. It has four stages:

1. **Cross** — the white cross on the bottom, solved directly (no daisy).
2. **F2L** (first two layers) — a white corner and its middle edge go in together as a pair. Four pairs.
3. **OLL** (orient the last layer) — make the whole top yellow in one algorithm.
4. **PLL** (permute the last layer) — move the top pieces into place in one algorithm.

Don't learn it all at once. Start with an intuitive F2L, then **2-look OLL** (10 algorithms) and **2-look PLL** (6). That's enough to get under a minute. Learn the full sets later, a few at a time.

> TIP
> Learn CFOP with the cross on the bottom and yellow on top, like the second half of the beginner method — every picture here is drawn that way.

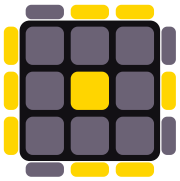
CFOP (SPEEDSOLVING)

2-look OLL

OLL makes the whole top yellow. **2-look OLL** does it in two steps: first the yellow cross (edges), then the yellow corners.

The edge step is the same as beginner step 4, with a faster algorithm for each shape. Then one of seven corner algorithms finishes the face.

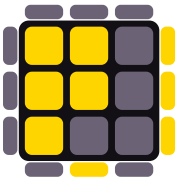
edges 3



Dot

`F R U R' U' F' f R U R' U' f'`

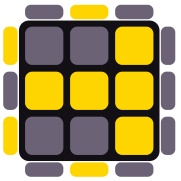
No yellow edges on top, only the centre.



L shape

`F U R U' R' F'`

Two yellow edges next to each other: hold them at the back and left (like 9 and 12 o'clock).

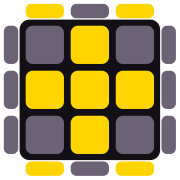


Line

`F R U R' U' F'`

Two yellow edges opposite each other: hold the line left to right.

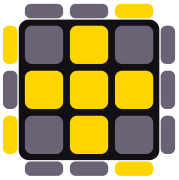
corners 7



H

`R U2 R' U' R U R' U' R U' R'`

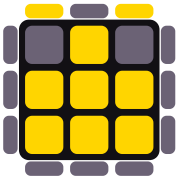
Yellow cross, no corners up; headlights of yellow on the front and back sides.



Pi

`R U2 R2 U' R2 U' R2 U2 R`

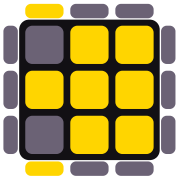
Yellow cross, no corners up; headlights of yellow on the left side.



Headlights

`R2 D' R U2 R' D R U2 R`

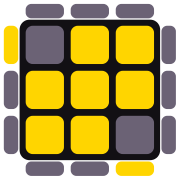
Yellow cross with the two front corners up; headlights of yellow on the back side.



Chameleon

`r U R' U' r' F R F'`

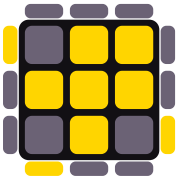
Yellow cross with the two right corners up; the left corners show yellow at the front and back.



Bowtie

`F' r U R' U' r' F R`

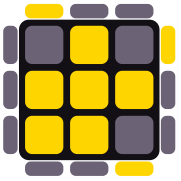
Yellow cross with two opposite corners up (front-left and back-right).



Anti-Sune

`R U2 R' U' R U' R'`

Yellow cross with one corner up, at the back-right; the front-right corner shows yellow on the right side.



Sune

`R U R' U R U2 R'`

Yellow cross with one corner up, at the front-left; the front-right corner shows yellow on the front side.

CFOP (SPEEDSOLVING)

2-look PLL

PLL moves the top pieces to their places, keeping the top yellow. **2-look PLL**: first swap the corners into place, then cycle the edges.

Arrows show where each piece goes.

corners 2



Headlights (T-perm)

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

Headlights on exactly one side: hold them on the left.



No headlights (Y-perm)

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

No headlights on any side: two corners need to swap across the diagonal.

edges 4



Ua-perm

`M2 U M U2 M' U M2`

A solved bar at the back and headlights on the other three sides; those three edges need to cycle anticlockwise (seen from above).



Ub-perm

`M2 U' M U2 M' U' M2`

A solved bar at the back and headlights on the other three sides; those three edges need to cycle clockwise (seen from above).



H-perm

`M2 U M2 U2 M2 U M2`

Headlights on all four sides, and every edge belongs on the opposite side.



Z-perm

`M' U M2 U M2 U M' U2 M2`

Headlights on all four sides, and every edge belongs on a neighbouring side (two pairs of edges swap).

AUF and finger tricks

AUF

AUF means “adjust the U face”: turning the top before or after an algorithm so the case matches the picture, or so the cube is solved at the end. Every OLL and PLL may need a `U`, `U'` or `U2` before it. Learn to see the case from any side, so you turn the top once instead of hunting.

Finger tricks

- Turn `U` with your right index finger pushing the back of the top layer, and `U'` with your left index finger.
- Do `R` and `R'` with a wrist turn, not by re-gripping.
- Hold the cube with your thumbs on the front and your fingers on the back. Try to finish a whole algorithm without letting go.
- Practise an algorithm slowly and smoothly first. Speed comes from not stopping, not from turning fast.

> TIP
> Learn an algorithm until your hands know it — then stop thinking of moves, and start recognising cases faster.