Andy Klise's Speedcubing Guide

Algorithms by Dan Harris and Erik Akkersdijk

First 2 Layers

You must solve the cross first. It can be done in 6 moves or less ~82% of the time and ≤7 moves 99.95% of the time
These are just optimal example solves; F2L should be solved intuitively.

Easy Cases (1-4)

U (R U' R')
Use (R' F R F') if no U face edges are oriented properly on final slot

y' (**R'** U' R)
Note – this image is blue and red because a cube rotation is required

y' U' (R' U R)
Use (F R' F' R) if no U face edges are oriented properly on final slot

(**R** U R')
Note – this image is green and red because no cube rotation is required

Reposition Edge (5-8)

(U' R U **R'**) U^2 (R U' R')

U' (R $U^{2\prime}$ **R'**) U^2 (R U' R')

y' (U R' U' **R**) U^2 (R' U R)
d (R' U' **R**) $U^{2\prime}$ (R' U R)
Note – (y' U) and (d) are interchangeable

y' U (R' U^2 **R**) U^2 (R' U R)
d (R' U^2 **R**) $U^{2\prime}$ (R' U R)

Reposition Edge and Flip Corner (9-14)

y' U (R' U' R U')(**R'** U' R)
y^2 U' (L U') d' (**L'** U' L)

U' (R U R' U)(**R** U R')

U' (R $U^{2\prime}$ R') y' U (**R'** U' R)

y' U (R' U^2 R) d' (**R** U R')
(R U' R' U)(R U' R') U^2 (**R** U' R') *
R' U^2 **R^2** U R^2 U R

y' U (R' U R U')(**R'** U' R)
d (R' U R U')(**R'** U' R)

U' (R U' R' U)(**R** U R')

Split Pair by Going Over (15-18)

y' (R' U R U') y U' (**R** U R')
(R U R') U^2 (R **U'** R' U)(R U' R') *
y (L' U L) U^2 y (**R** U R')

(R U' R' U) y' U (**R'** U' R)
(R U' R') U^2 (**F'** U' F)

(R U^2 R') U' (**R** U R')

y' (R' U^2 R) U (**R'** U' R)

Pair Made on Side (19-22)

U (R **U2** R') U (R U' R')

y' U' (R' **U2** R) U' (R' U R)

U^2 (R **U** R' U)(R U' R')

y' U^2 (R' **U'** R U')(R' U R)

Weird (23-24)

(R U R' U') U' (R U R' U')(**R** U R')
U^2 R^2 U^2 (R' U' R **U'**) R^2

y' (R' U' R U) U (R' U' R U)(**R'** U' R)
y' U^2 R^2 U^2 (R U R' **U**) R^2
F U (R U' R' F')(R U' R')

Corner in Place, Edge in U Face (25-30)

y U' (L' U **L**) d (R U' R')
(R U' R' U')(R U' R' U)(**R** U R')
R' F' R U (R U' **R'**) F
U' (F' U **F**) U (R U' R')

U (R U' **R'**) y U' (L' U L)
U (R U' **R'**) U' (F' U F)
Note – (y U') and (d') are interchangeable

(R **U'** R' U)(R U' R')

y' (R' **U** R U')(R' U R)
(**R** U' R') U^2 (F' U F)

y' (R' U' R U)(**R'** U' R)

(R U R' U')(**R** U R')

Edge in Place, Corner in U face (31-36)

(R U' R') y' U (R' U R)
(R U' R' U)(F' U F)

(R U R' U')(R U R' U')(**R** U R')

(U' R U' **R'**) U^2 (R U' R')
y U' (L U' **L'**) U^2 (L U' L)

U' (R $U^{2\prime}$ R') U (**R** U R')
U (R U R') U^2 (**R** U R')
d (R' U **R**) U^2 (R' U R)

(U' R U R') y' (U **R'** U' R)
U^2 (R U' R') U' (**F'** U' F)

y' (U R' U' R) y (U' **R** U R')
y U^2 (L' U L) U (**F** U F')

Edge and Corner in Place (37-42)

Solved Pair

(R U' R') d (R' U^2 **R**) $U^{2\prime}$ (R' U R)
(R U R') U^2 (R U^2 R') d (**R'** U' R)

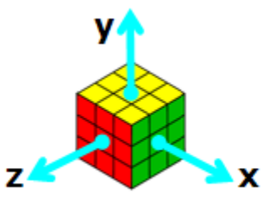
(R U' R') U' (R U **R'**) U^2 (R U' R')
y (L' U' L) U^2 (L' U L U')(**L'** U' L)

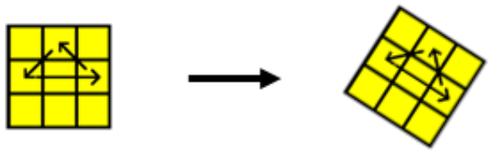
(R U' R' U)(R **$U^{2\prime}$** R') U (R U' R')
(R U R') U^2 (R U' R' U)(**R** U R')

(R U' R' U) y' (R' U' R U')(**R'** U' R)
y (L' U' L U)(L' U L) U^2 (**F** U F')

(R U' R' U) d (R' **U'** R U')(R' U R)
(R U R' U')(R U' R') U^2 (**F'** U' F)

Color Coding
Green = R U R' U' Family
Blue = R U R' U R U^2 R' Family
Orange = R F' R' F Family





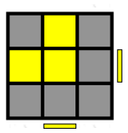
Credits

Dan Harris - http://www.cubestation.co.uk/
Erik Akkersdijk - http://www.erikku.110mb.com
Nathan Christie - http://my.fit.edu/~dchristi/cube/
Joël van Noort - http://solvethecube.110mb.com/
Conrad Rider - http://cube.crider.co.uk/
And everyone else

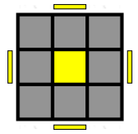
For more guides just like this, visit my website -
http://www.kungfoomanchu.com/

Orient Last Layer (Two Look)

Step 1

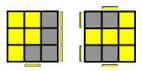


F U (R U' R') F'
y² f (R U R' U') f'
Probability = ½



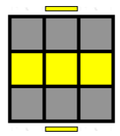
F (R U R' U') F' f (R U R' U') f'
(R' F R F') U² (R' F R F²') U² F
Probability = 1/8

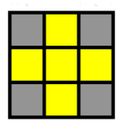
Bonus



F (R U R' U') F'
Probability = ¼

Move to Second Look
Probability = 1/8



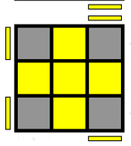


Orient Last Layer (Two Look)

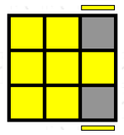
Step 2

All Edges Oriented Correctly

(R U R' U R U²' R')
y' (R' U² R U R' U R) *
Probability = 4/27



R U²' R²' U' R² U' R²' U² R
Probability = 4/27

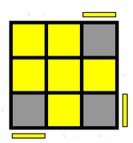


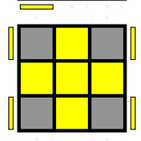
x (R' U')(L U)(R U')(L' U)
y x' (R U R') D (R U' R') D' x
Probability = 4/27

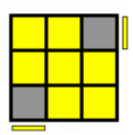
(R' U' R U' R' U² R)
y (R U² R' U' R U' R')
Probability = 4/27

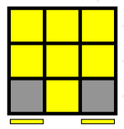
(R U R' U)(R U' R' U)(R U² R')
y R U² R' (U' R U R')(U' R U' R')
Probability = 2/27

(R' F)(R B')(R' F')(R B)
y² x' D (R U R') D' (R U' R') x
x (R' U R) D' (R' U' R) D
Probability = 4/27



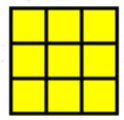




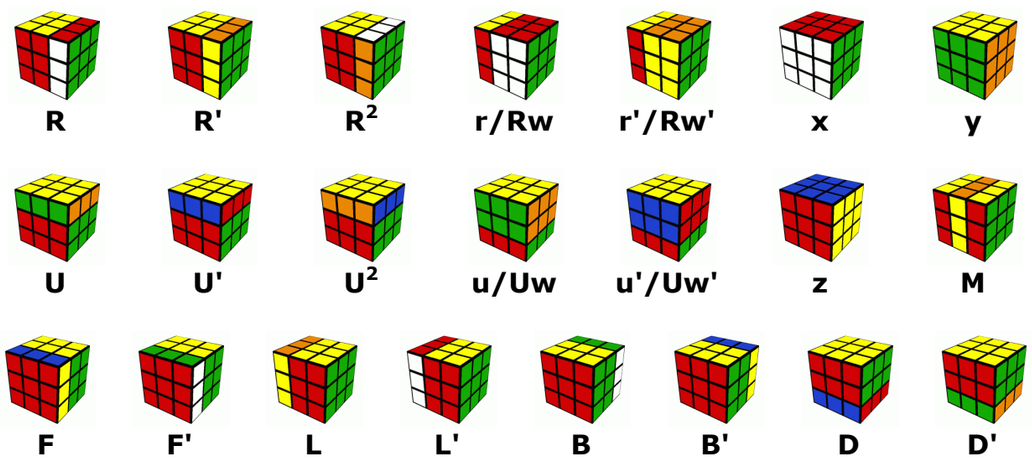


(R²' D)(R' U²)(R D')(R' U² R')
y² (R² D')(R U²)(R' D)(R U² R)
Probability = 4/27

Solved
Probability = 1/27



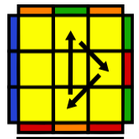
Notation



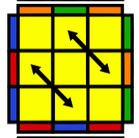
Permute Last Layer

* - indicates a faster alg. If this is included, then the previous alg is easier to learn

Permutations of Edges or Corners Only

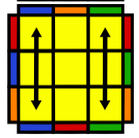


R² U (F B') R² (F' B) U R²
y (R²' U)(R U R' U')(R' U')(R' U R') *
y (M²' U' M) U² (M' U' M²')
Ub - Probability = 1/18



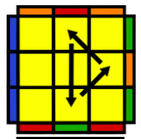
x' F (R U' R' U)(D R')(D U')(R' U R) D²'
(R' U' R U') R U (R U' R' U) R U R² U' R' (U²) *
y (M²' U' M') U²' M²' U²' (M' U M²')
Z - Probability = 1/36

x (R' U R') D² (R U' R')(D² R²)
Aa - Probability = 1/18

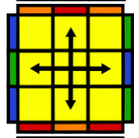


x' (R U' R') D (R U R') D' (R U R') D (R U' R') D'
R² U R' y (R U' R' U)*3 y' R U' R² *
x' (R U' R') D (R U R') u² (R' U R) D (R' U' R)
E -Probability = 1/36

R² U' (F B') R² (F' B) U' R²
y' (R² U')(R' U' R U)(R U)(R U' R) *
y (M²' U M) U² (M' U M²')
Ua - Probability = 1/18

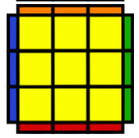


(M²' U' M²') U² (M²' U' M²')
(R' M²' R) U' (R' M²' R) U² (R' M²' R) U' (R' M²' R)
H - Probability = 1/72

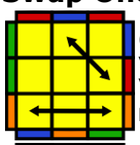


x (R² D²)(R U R') D² (R U' R)
Ab - Probability = 1/18

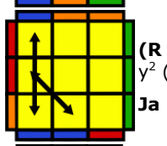
Solved
Probability = 1/72



Swap One Set of Adjacent Corners

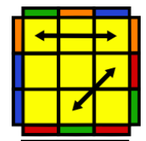


(R U²')(R' U²)(R B')(R' U' R U)(R B R² U)
y' (R U' R' U')(R U R) D (R' U' R) D' (R' U² R')(U')
y² z (U R²')(U' R²)(U F')(U' R' U R)(U F U²' R)
Ra - Probability = 1/18

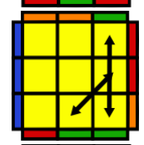


(R U')(L' U)(R' U²)(L U')(L' U²') L
y² (R' U² R) U z D' (R²' U)(R' D R U') z' *
Ja - Probability = 1/18

(R' U²)(R U²')(R' F)(R U R' U')(R' F' R² U')
Rb - Probability = 1/18

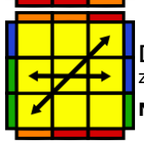


(L' U)(R U')(L U²)(R' U)(R U²') R'
(R U R' F')(R U R' U')(R' F)(R² U')(R' U') *
Jb - Probability = 1/18



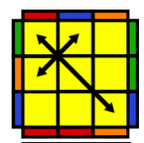
Swap One Set of Corners Diagonally

(R' U R' U') y (R' F')(R² U')(R' U R' F)(R F)
(R' U R' U') x² y' (R' U R' U') l (R U' R' U) R U
V - Probability = 1/18

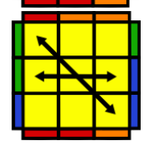


[(L U') R U²' (L' U) R']*2 U'
z (R' U R') D (R²' U' R)(U D')(R' D R²' U' R D') *
Na - Probability = 1/72

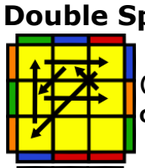
F (R U')(R' U' R U)(R' F')(R U R' U')(R' F R F')
F R U (R U² R')(L' U R U')(L U²')(R² F')
Y - Probability = 1/18



[(R' U) L' U² (R U') L]*2 U
(R' U R U')(R' F' U')(F R U)(R' F R' F')(R U' R) *
Nb - Probability = 1/72



Double Spins



(R²' u)(R' U R' U')(R u') R² y' (R' U R)
Ga - Probability = 1/18

(R U R') y' (R² u')(R U' R' U)(R' u) R²
Gd - Probability = 1/18

(L² u')(L U' L U)(L' u) L² y' (R U' R')
y² (R² u')(R U' R U)(R' u) R² y (R U' R') *
Gc - Probability = 1/18

(L' U' L) y (L²' u)(L' U L U')(L u') L²
y² (R' U' R)(U D')(R²' U)(R' U R U')(R U') R² D U' *
(L' U' L) y' (R²' u)(R' U R U')(R u') R²
Gb - Probability = 1/18