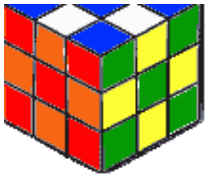


The printed version of a site.

The puzzle Rubik's Cube or “ the Hungarian cube ” has drawn attention, and has received the broadest distribution. Rubik's Cube (commonly misspelled rubix, rubick's or rubics cube) is a Mechanical puzzle invented by Erno Rubik's. We shall try to tell about how to put in order the mixed Rubik's Cube.In 1977 Erno Rubik's most original of all puzzles was patented. Rubik's Cube was actually in the making a few years before 1977; it's official invention year was 1974 in Budapest Hungary. It was called by several different names, including the Cube, the Hungarian Cube, and the Magic Cube, until the Ideal Toy Corporation bought the rights in September 1979 and renamed it Rubik's Cube. Rubik's cube has nine square on each side. The puzzle comes in four widely available versions: the 2×2×2 ("Pocket Cube"), the 3×3×3 standard cube, the 4×4×4 ("Rubik's Revenge"), and the 5×5×5 ("Professor's Cube").

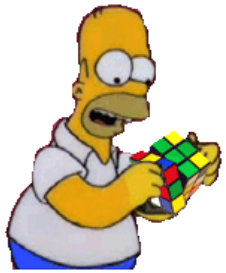
Accepted system of designations: sides of a Rubik's Cube are designated by letters **F, B, R, L, U, D** initial letters of words a facade, back, right, left, up, down. The central cubes define color of a side, that is it is possible to tell, what even in completely mixed cube the central cubes are picked already up and it is necessary to attach to each of them on 8 cubes of the same color. The central cubes are designated by one letter: **f, r, l, u, d** .

Costal cubes (them 12 pieces) belong to two sides and are designated by two letters, for example **f-r, r-u, f-d** , etc. Angular cubes - three letters under the name of sides, for example, f-ri-t, f-l-b , etc. Capital letters **F, B, R, L, U, D** designate elementary operations of turn of a corresponding side (layer) of a cube on 90 ° clockwise. Designations **F ', B ', R ', L ', U ', D '** correspond to turn of sides on 90 ° counter-clockwise. Designations **F*2, R*2** , etc. speak about double turn of a corresponding side (**F*2 = FF**).

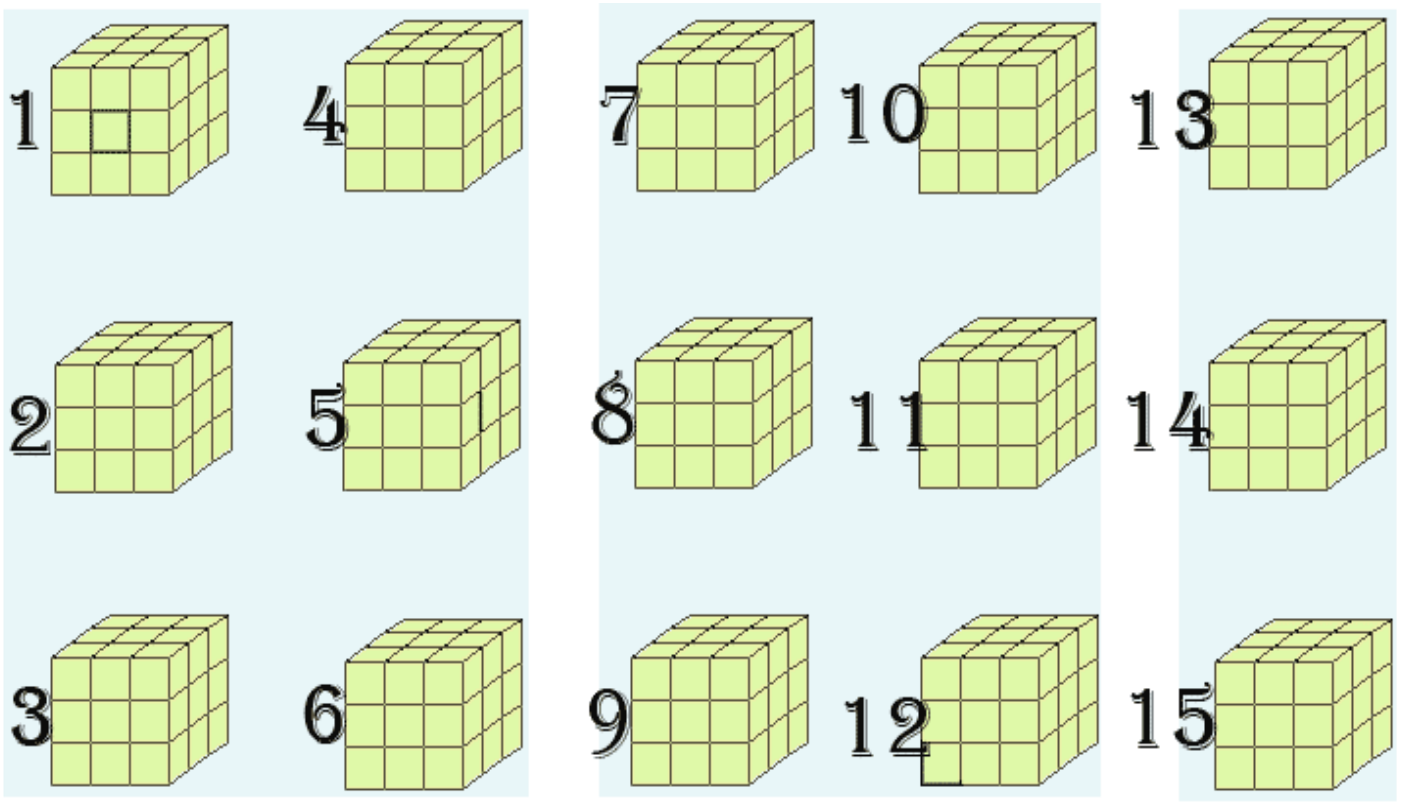
The letter **C (center)** designate turn of an average layer. The interlinear index shows, on the part of what side it is necessary to do this turn. For example **Cr** on the part of the right side, **Cd** on the part of down, **C'l** - on the part of left, counter-clockwise, etc. The Letter [O] turn (revolution) of all cube. **[O-f]** on the part of a front side clockwise, etc. Record of process **(F' R') D*2 (R F)** means: to turn a front side counter-clockwise on 90 °, the same the right side, to turn the bottom side twice (that is on 180 °) to turn the right side on 90 ° but to a hour hand to turn a front side.

Now we shall pass actually to assembly of a Rubik's Cube. There are some different systems, but we most of all like level-by-level assembly when collect all over again one layer, then to the second and, at last, the third. Only 7 stages of assembly of this game.

My letter box
cube2007 @mail.ru__cat @rostel.ru__oleg.bujanov @gmail.com



The basic turns of a Rubik's Cube

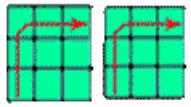


- 1 Front
- 2 Front opposite
- 3 Up
- 4 Up opposite
- 5 Left
- 6 Left opposite
- 7 Back
- 8 Back opposite
- 9 Down
- 10 Down opposite
- 11 Right
- 12 Right
- 13 **C (center)** - front =Cf
- 14 Cd
- 15 Cr

1 stage of assembly of a Rubik's Cube

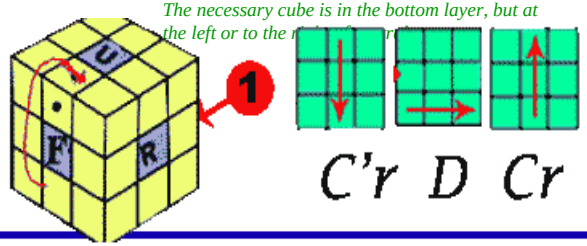
The necessary cube falls downwards turn of a corresponding lateral side (Ri,Re,L) and is deduced on a front side by operation B, B' or B*2. Operation of deducing by mirror turn of the same lateral side restoring initial position of the mentioned costal cube of the top layer (opposite) comes to an end.After that operation a) or b) the first stage is carried out. In a case a) the cube has left on a front side so, that color of his forward side coincides with color of a facade. In a case b) in is necessary not only to move a cube upward, but also to develop it that it has been correctly focused, becoming on the place. In figures points mark a place on which there should be the necessary.

The necessary cube is under the central cube.

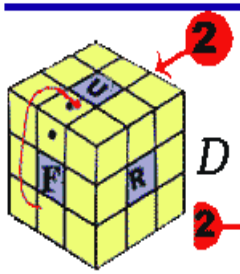


F F

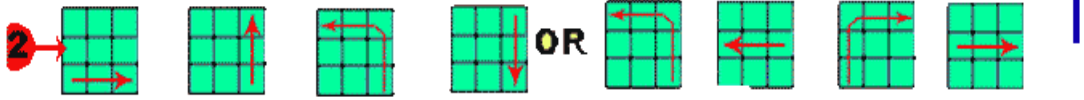
The necessary cube is in the bottom layer, but at the left or to the r



C'r D Cr

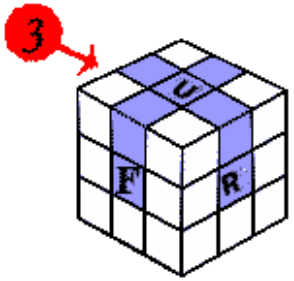


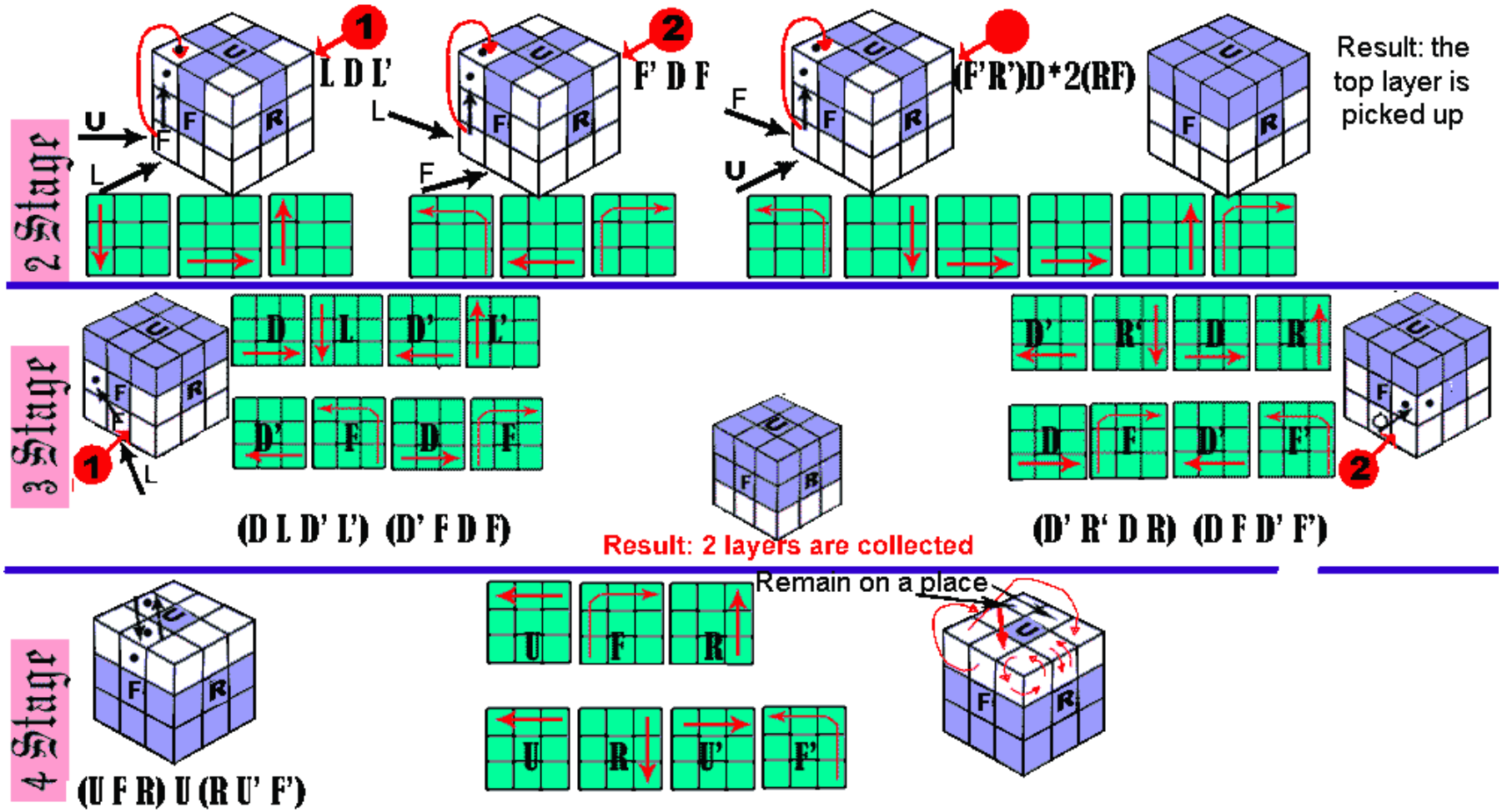
D R F' R'



F' C'd F Cd

Result: the cross of the top side is collected

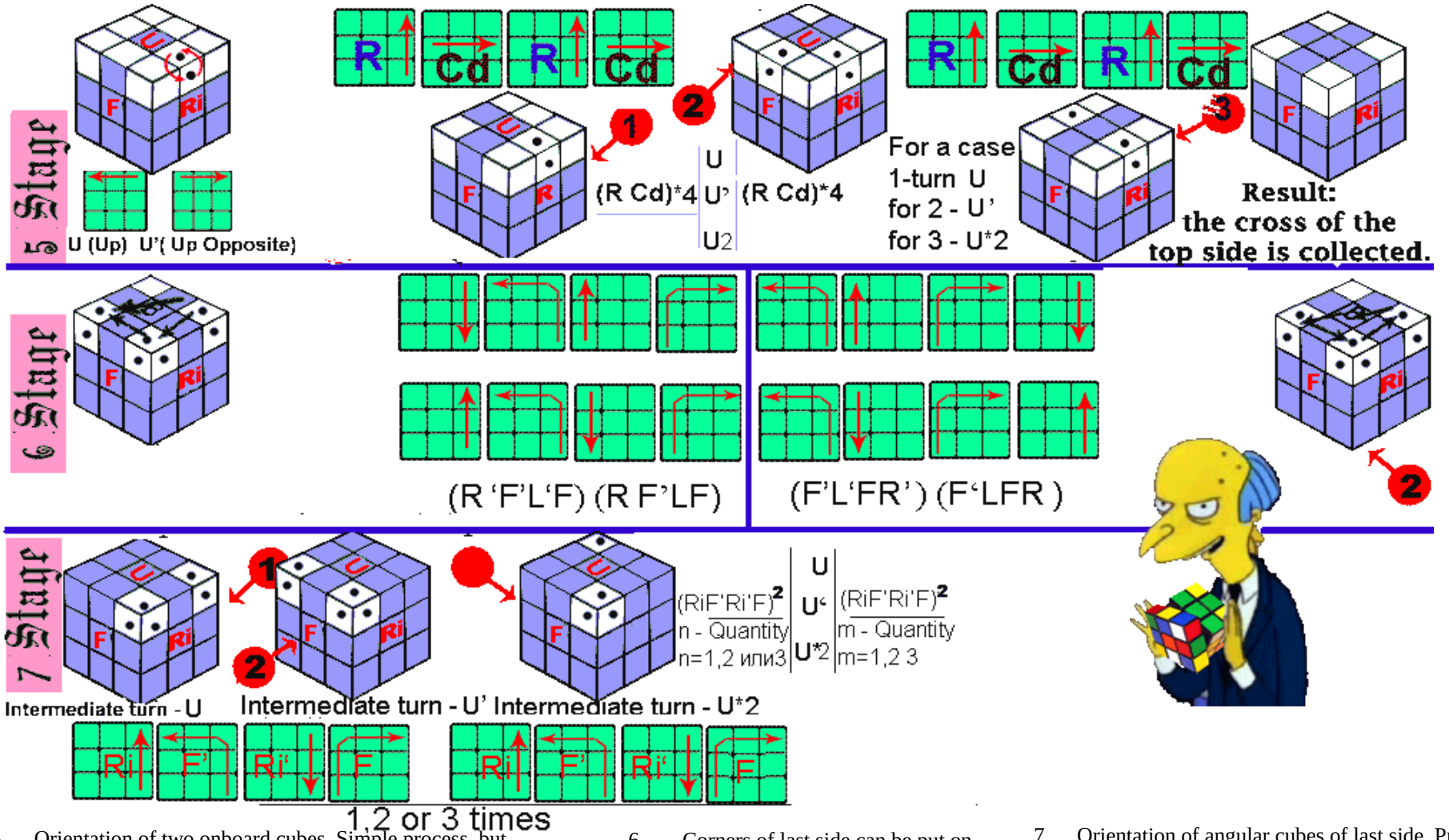




2___We find the necessary angular cube (which has colors of sides Front, Top, Left) and in the same way which is described for the first stage, we deduce a cube in the left corner of the front side chosen you. Here there can be three cases of orientation of this cube. Compare the case to figure and apply one of three operations of the second stage. Points mark a place on which there should be a cube necessary to you. Find on a cube other three angular cubes and repeat the described reception for their moving on the places of the top side. Result: the top layer is collected. First two stages do not cause difficulties: it is easily possible to watch the actions. All attention is inverted on one layer. That is done in two rest is absolutely unimportantly.

3____Belt. We find the necessary cube and all over again it is deduced downwards on a front side. If it below it is translated by his{its} simple turn of the bottom side before concurrence to color of a facade. If it{he} on the average a belt it needs to be lowered all over again downwards by means of operation 1) or 2). Then to combine on color with color of a front side and to do operation of the third stage 1) or 2). Result: it is collected two layers.

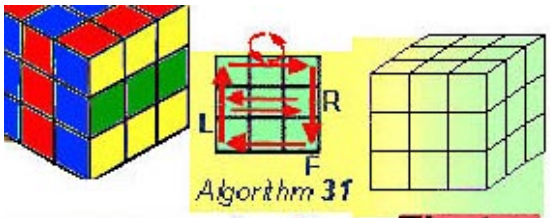
4_____Cross of the bottom side. In the purpose result the operations moving onboard cubes of one side, not breaking the order in the collected layers. Process which allows to pick up all onboard cubes of a side is shown in figure. In the same place it is shown, that occurs thus to other cubes of a side. Repeating process, having chosen other front side, it is possible to put all four cubes on a place. Result: costal cubes are on the places. But, as a rule - two of them are focused incorrectly.

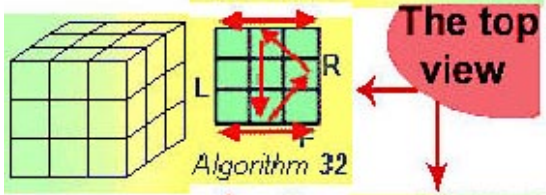


5___Orientation of two onboard cubes. Simple process, but sometimes causes difficulties. It is necessary to take into account, that the unwrapped cube should be on the right side (in figure it is marked with arrows). In figures 1, 2 and 3 chances of an arrangement of not correctly focused cubes (they are marked with points) are submitted. Using the common formula in case of 1 it is required to execute intermediate turn U (Up) to deduce the second cube on the right side. In case of 2 and 3 accordingly turn (U or U'). After the first part of process (Cd) *4 the necessary cube is unwrapped as it is necessary, but the order in the collected layers is broken. Execute intermediate turn, not paying attention to breakage of the bottom layers. Do further a part of process (R-Cd) *4, and all begins on the places. Result: the cross is collected.(Cd - Center Layer_down)

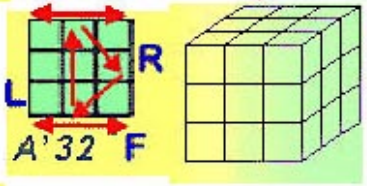
6____Corners of last side can be put on the places, using 8-running process. Direct process rearranges three angular cubes in a direction clockwise. Return process rearranges three cubes counter-clockwise. After the fifth stage even one cube will rise on the place (probably incorrectly focused). Turn a cube that this cube was in the left distant corner, and repeat process one or two times while all cubes do not begin on the places. Result: all angular cubes have occupied the places. 2 or 4 cubes will be focused incorrectly.

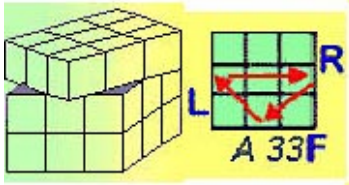
7___Orientation of angular cubes of last side. Process is easy for remembering, it is repeatedly repeated sequence of turns (R-F'-R'-F). Turn a cube that the cube which you want to unwrap was in a right top corner of a front side. 8-running process (=2*4), will turn it on 1/3 revolutions clockwise. If it is necessary repeat 8-running process. Do not pay attention to the bottom layers, harmony will be restored. In figure three cases of an arrangement of "bad" cubes (they are marked by points) are shown. In case of 1 intermediate turn U (Up), in с л у ч а е 2 turn (U ') (Up opposite) is required. In case of 3 turn (D*2) is necessary. Result: last side is collected. It is necessary to turn it, and all - the cube is collected.

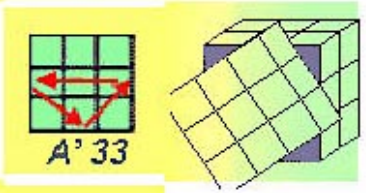




The top view







Stages of assembly of a Rubik's Cube

The cube demands from everyone almost discoveries: everyone should define area of researches, « to plan experiments », « to find principles », « to construct the theory » and to receive scientific work in the form of record of courses of the interesting sample. Let's result formulas of some processes which are necessary at last stages.At the fourth stage it is possible to involve process **A31** rearranging two opposite onboard cubes and overturning cube behind. The cube **fu** (ahead) remains untouched. Angular cubes thus move clockwise.

F R U - R' U' F' - U' - F R U - R' U' F'.....A31

Process **A32** Rearranges three onboard cubes against hour hand, return **(A'32)** - clockwise. A cube **TL** Remains on a place. Angular cubes vary places in pairs.

F R U - R' U' F'.....A32

F U R - U' R' F'.....A'32

Process **A33** rearranges three cubes clockwise, not overturning them (not changing color of the top side) **A'33** - counter-clockwise All other cubes remain.

(F*2) U Cr - (U*2) - (Cr') U (F*2).....A33

(F*2) U' Cr - (U*2) - (Cr') U' (F*2).....A'33

Algorithm **A34** serves for an exchange of places of two pairs next cubes of a side, not overturring them.

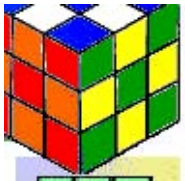
(Cf*2) D' (Cr*2) - D - (Cr') (Cf*2) Cr.....A34

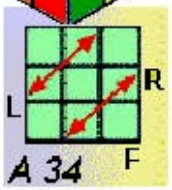
Process **A35** does the same with opposite cubes

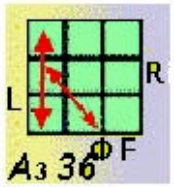
(Cr*2) U (Cr*2) - (U*2) - (Cr*2) U (Cr*2)....A35

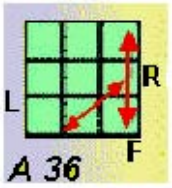
Algorithm A'7 next page

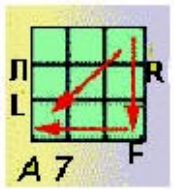
My letter box
cube2007 @mail.ru__cat @rostel.ru__oleg.bujanov @gmail.com

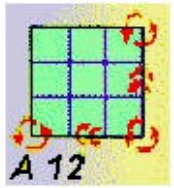


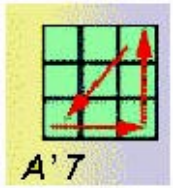


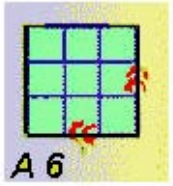


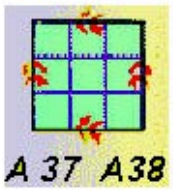


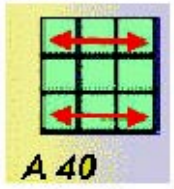




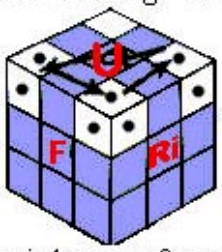






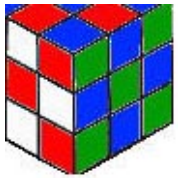


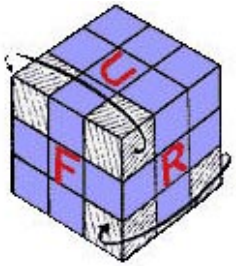
Process (A36) rearranges two next onboard cubes and one is temporary for angular to the scheme, not changing color of a side.
R(U*2) - R'U' - R(U*2)L' - UR'U'L A36
The same action makes mirror process A3_36
L'(U*2)LU - L'(U*2)RU' - LUR'.....A3_36
For a turn of onboard and angular cubes of last side the algorithm is sometimes good. A' 12 - clockwise and (A12) against.
FU(F*2) - LF(L*2) - UL(U*2).....A12
(U*2)L'U' - (L*2)F'L' - (F*2)U'F'.....A' 12
If process to do twice angular cubes will be developed only. The sign on a turn thus will change on return. for a turn at once two next onboard cubes it is possible to use algorithm A6.
(R*2)(F*2) - (R*2)(F*2) - RU'(R*2)U - FRU(F*2) - U'F.....A6
The simultaneous turn of tour onboard cubes gives algorithm (A37).
[(F*2)C'r - (F*2)(Cr*2)] U' [(Cr*2)(F*2) - Cr(F*2)] U.....A37
The same result gives process A38.
(UCr)*4 - (U*2) - (UCr)*4 - (U*2).....A38



To moving three angular cubes with a turn of two of them apply described for the sixth stage of assembly algorithm A7.
R'F' L'F - RF' LF.....A7
F'L' FR' - F'L FR.....A' 7
Moving of three angular cubes with a turn of all of three gives 22-rotations, but it is possible to manage it, using algorithm A7.
Paired moving of angular cubes is cross-wise made by process color of a side does not vary, that is cubes do not overturn.
[(Cr*2) - U - (Cr*2) (U*2)]*2.....A39
The parallel exchange of angular cubes gives algorithm A40
(R'D F'(D*2) - FD' R(U*2))*2.....A40

As a result of some operations the central cubes leave from the place. The cube changes orientation. But, as is known, color of a side can be defined on color of the central cube. That in the end of a problem rientation of all cube Was same, as well as in the beginning, operations of turn of all cube entered Of, Or, Ou and item. Each such operation is considered one course.

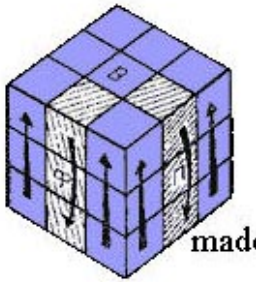




Stages of assembly of a Rubik's Cube

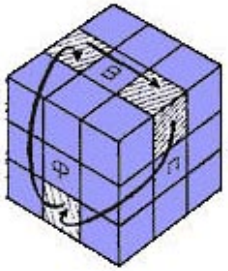
(F R F' R') *3.....A2

Of two pairs (f-l-u, f-u-r) and (r-d-b, f-d-r) will be changed by places of corners. They will change orientation. All other cubes will remain on a place.



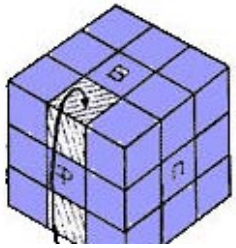
[(F*2) (R*2)] *3.....AA

Double rearrangement. The exchange between onboard cubes (f-u, f-d) and (r-u, r-d) will be made.



Cyclic rearrangement of 3 cubes. Cubes settle down the letter «T» on 3 sides.

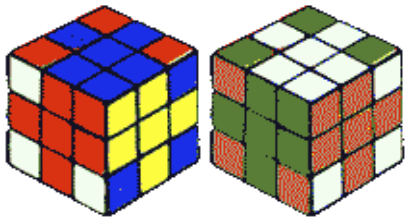
U' L R' – (F*2) R L' U'.....AA



This algorithm allows to move the bottom side of a cube f-d upward and correctly to focus it. Process touches only 3 onboard cubes: f-u, f-d, b-d.

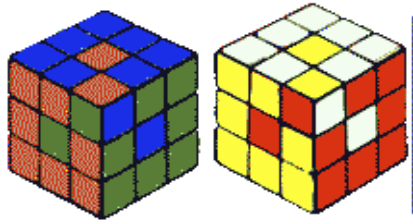
L' R (F*2) – L R' (D*2).....AA

№ 1



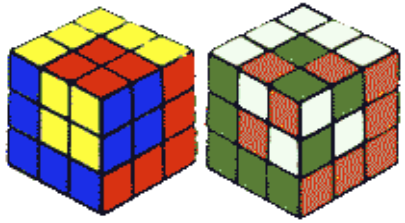
R'(Cr*2)(Cf*2)(U*2)(Cr*2)(Cf*2)
(D*2)RUD' (C'd)R'
(Cr*2)(Cf*2)(U*2)
(Cr*2)(Cf*2)(D*2) RU'DCd
(L*2) R'DR FDF' U'FD'
F'R'D' RU(L*2) 38 courses

№ 2



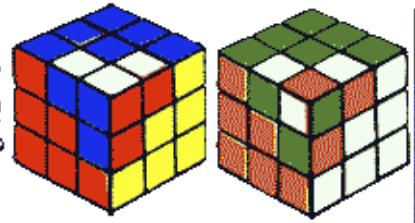
(L*2)R' DRF DF'U' FD'F'
R'D'RU
(L*2) CfCd Cf'(Cd')
20 courses

№ 3



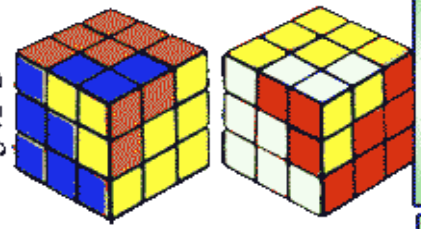
R'(U*2)DB' Cd(B*2)
(Cd')B'(U*2) D'RL (D*2)U'
FCd(F*2) (Cd')F(D*2) UL'
(Cd')(Cr')CdCr (L*2)R'DR FDF'
U'FD' F'R'D' RU(L*2) 42 courses

№ 4



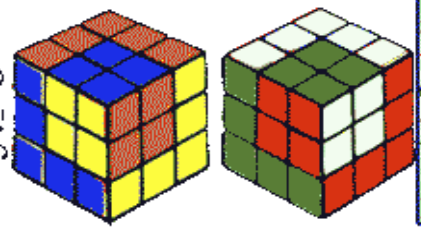
(L*2)R'DR FDF' U'FD'F'
R'D'RU (L*2) –
R'(U*2) DB'Cd(B*2)
(Cd')B'(U*2)D'R –
L(D*2)U'FCd(F*2)(Cd')F(D*2)
UL' 37 courses

№ 5



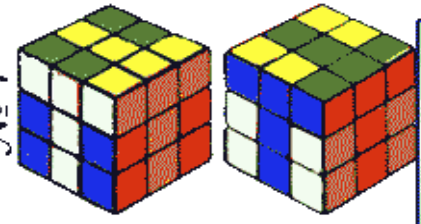
(L*2)R'DR FDF' U'FD'F'
R'D'RU(L*2) – [R'(U*2)DB'
Cd(B*2)(Cd')B'(U*2)D'R]*2
L(D*2)U' FCd(F*2)
(Cd')F(D*2) UL' 49 courses

№ 6



(L*2)R'DR FDF' U'FD'F'
R'D'RU (L*2) [R'(U*2)DB'
Cd(B*2) (Cd')B'(U*2)D'R]*2
L(D*2)U' FCd(F*2)
(Cd')F(D*2)UL'CfCd(Cf')(Cd')
53 courses

№ 7



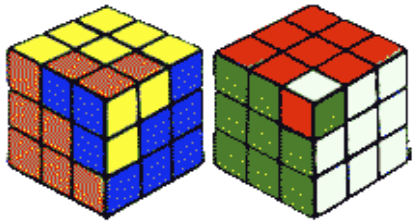
(Cr')(Cd*2)Cr(Cd*2)
FBCf (Cr*2)U
(Cr*2)(U*2)(Cr*2)U
(Cr*2)(D*2)

33 courses

Compositions ready

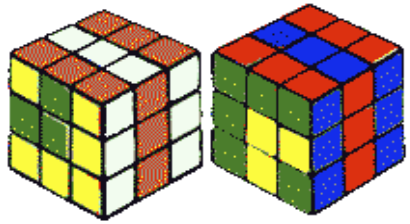
Готовые композиции

№ 8



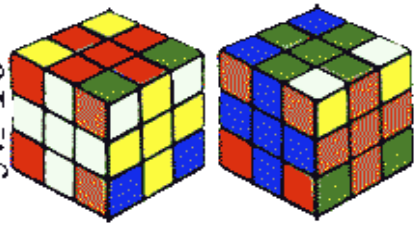
(L*2)R'DR FDF' U' FD'F'
R'D'R U(L*2)
[R'(U*2)DB'
Cd(B*2)(Cd')B'(U*2)D'R]*2
38 courses

№ 9



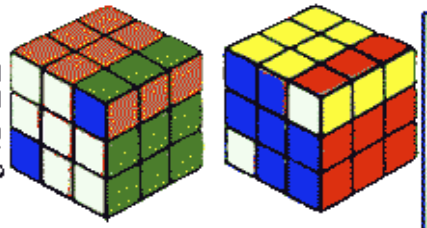
(Cr*2)U(Cr*2)(U*2)(Cr*2)U(Cr*2)
(F*2)(B*2)(Cf*2)(D*2)
C'r (D*2) Cr (D*2) Cf (D*2) C'f
C'r (Cd*2)Cr (Cd*2) F' B C'f
(Cr*2)(D*2) (Cr*2)(D*2) C'r 30 courses

№ 10



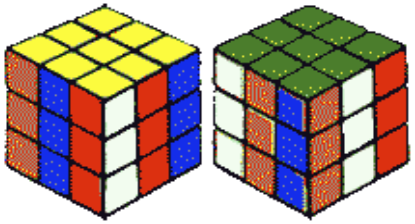
[RCdL(Cd')]*7
LR' (Cr')U D'(Cd')
[RCdL(Cd')]*7
62 courses

№ 11



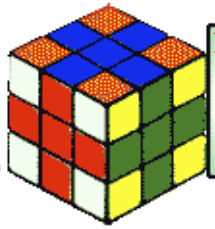
FL(D*2) - R'D(L*2) -
D'R(D*2) L'F(L*2) - (F*2)
13 courses

№ 12



(R*2)(F*2)(R*2)(F*2) RU'(R*2)
UF RU (F*2)U'FU
(R*2)(F*2)(R*2)(F*2) RU'(R*2)
UF RU (F*2)U'FU
(R*2)(L*2)(Cr*2)
(R*2)(F*2)(R*2)(F*2) RU'(R*2)
UF RU (F*2)U'FU
(R*2)(F*2)(R*2)(F*2) RU'(R*2)
UF RU (F*2)U'F U'
[L'FLF']*2 U [FL'F'L]*2 U
[L'FLF']*2 U [FL'F'L]*2 U
[R'DF'(D*2) FD'R(U*2)]*2
(F*2)(B*2)(Cf*2)
[L'FLF']*2 U [FL'F'L]*2 U
[L'FLF']*2 U [FL'F'L]*2 U
[R'DF'(D*2)FD'R(U*2)]*2
FBCf (R*2)(L*2)Cf(D*2)(Cf*2)
(D*2)Cf L' 181 courses

№ 13



R'(Cr*2)(Cf*2)
(U*2)(Cr*2)
(Cf*2)(D*2)R
8 courses

№ 14

[Of((U*2)(Cr*2)
U(Cr*2)
(U*2) (Cf*2)
D'(Cf*2))]*2
19 courses
Of = F B Cf

Compositions ready

№ 15

(Cr*2)(Cd*2)(Cf*2)

3 courses

№ 16

| ((Cf*2) D (Cf*2)(U*2)(Cr*2) U'
(Cr*2)(U*2) (O'f) | *2 (Of*2)
(C'r)(C'd) CrCd OrOu
(Cr*2)(Cf*2)(Cd*2) *28 courses*
O'f=F'_B'_C'f Or=R_L'_Cr Ou=U_D'_C'd

№ 17

| ((Cf*2) D (Cf*2)(U*2)(Cr*2) U'
(Cr*2)(U*2) (O'f) | *2 (Of*2)
((C'r)(C'd)CrCd) OrOu
(Cr*2)(Cf*2)(Cd*2) *28 courses*

№ 18

(D*2) Cr (Cf*2) (C'r) (U*2)

5courses

№ 19

U' (B*2)(L*2) U(Cr*2)U'
(R*2)(F*2)D FBRCd R'B'R' Cd
(R*2) (C'd) R' F' (B*2)(R*2)(B*2)
(F*2) Cf Of Ou 27 courses

№ 20

(R*2)(F*2) (Cr*2)(B*2)(L*2)
(Or*2) Cr
8 courses

№ 21

Variant A - (L*2)R' DR FDF' U' FD'F'
R'D'R U(L*2) *16 courses*
Variant B - F' U' B(U*2) B' UR(U*2)
R' F B D F'(D*2) FD'L'(D*2) LB'
20 courses

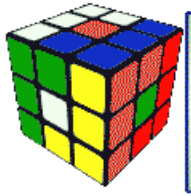
R' (U*2)DB'Cd(B*2)(C'd)B'(U*2)
D'R -- L(D*2)U' F
Cd (F*2) (C'd)F(D*2) UL'
(C'd)(C'r) CdCr 24 courses

(FBLR)*2 - LR

10 courses

FL(D*2) - R'D(L*2) - D'R(D*2)
L'F(L*2) - (F*2)

13 courses



(Cr*2)(Cf*2) [Cr(R*2) Ou] *4
Ou = U(D')(C'd)

14 courses

(Cr*2)D'(Cr*2)(D*2) --
(Cr*2)U'(Cf*2)Cd

8 courses

(FBLR)*3 - (U*2)(D*2)

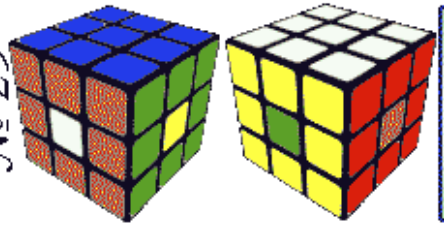
14courses

Cd Cr - (C'd) (C'r)

4 courses

Compositions ready

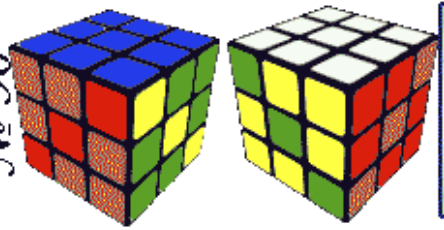
№ 29



(R*2)(L*2)UD'
(F*2)(B*2)UD'

8 courses

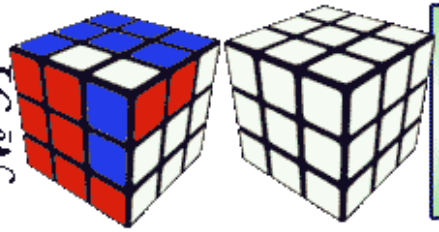
№ 30



(F B L R)*3

12 courses

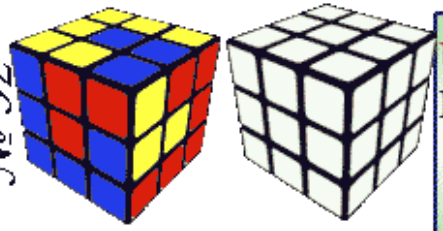
№ 31



U(R*2)(D*2)(B*2) U'F(L*2)
BRD RBR'D' (F*2)(U*2)

16 courses

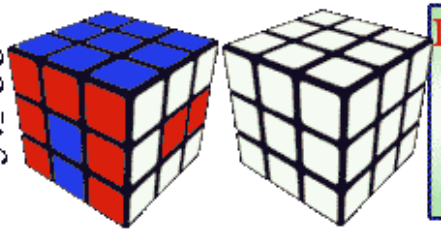
№ 32



U' (L*2)(U*2)(R*2) U'(B*2)L'
BDR'B'L'B' (D*2)B'LDB'U'

19 courses

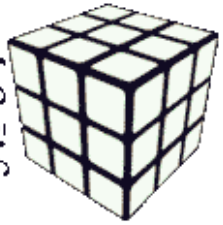
№ 33



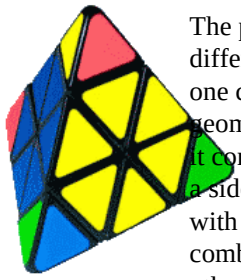
D'UBD' L'RFD' B'D'UL

12 courses

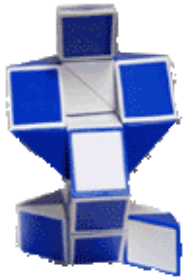
№ 34



News from the world of the Rubik's Cube



The pyramid.Mechanical puzzle with 4-м я the sides of different color. The purpose - to collect all elements of one color on one side. The pyramid represents a geometrical body a tetrahedron. As well as Rubik's Cube, it consists of elements which at turn of sides can mix from a side on a side, only the role of cubes is carried out here with small tetrahedrons from which the big tetrahedron is combined. It is the version of Rubik's Cube, for assembly other algorithms be required, in fact moving of game elements - 14 small analogues of a pyramid occurs around of the axes located under the attitude to each other not under a right angle, as at Rubik's Cube.



Rubik's Twist.This puzzle - one more creation of professor Rubika, and not less popular than Rubik's Cube. The snake is made of 24 identical triangles which have connection among themselves. The simple mechanism of connection allows to rotate triangles among themselves in such a manner that the Swan or the Bat, either the Ball, or the Dog as a result can turn out, or.. Yes anything you like. Here there are no true and incorrect answers - all depends on your imagination!

Rubik's Brain Racker.Novelty 2007! At you on five elements from 1 up to 5 each of 4 colors - red, yellow, green and dark blue. It is enough to take out “ key ” the element and triangles can move among themselves. Three games in one: the problem to collect this or that pattern from one or several colors (1-st level of complexity), or the same, but also to arrange figures under the order (2-nd level of complexity), or (3-rd level of complexity and it is really complex!) to collect 12 color plates; so that in everyone there were all of 5 figures!

Rubik's World.Globe Rubika is a puzzle with the same mechanism, that at and Rubik's Cube 2 x 2. Difference in the form of the puzzle. Together with logic and spatial imagination, the toy acquaints with continents of our planet. Owing to a convenient support, the Globe always will be on the place.

History of creation of game 'Rubik's Cube'.In 1977 Erno Rubik's most original of all puzzles was patented. Rubik's Cube was actually in the making a few years before 1977; it's official invention year was 1974 in Budapest Hungary. It was called by several different names, including the Cube, the Hungarian Cube, and the Magic Cube, until the Ideal Toy Corporation bought the rights in September 1979 and renamed it Rubik's Cube, after first considering calling it The Gordian Knot.
Rubik's Cube inventor Erno Rubik was born in 1944 in Budapest, Hungary. In 1967, he earned an architect degree from the University of Technical Education of Budapest, followed by a second degree in design in 1970. It was during his early years as a high school teacher that the idea of The Cube was conceived.
Initially Rubik studied variations of a 2x2x2 cube, but found the simplest and most workable model to be a 3x3x3 cube. The interior mechanism, which is basically cylindrical, took some time to design. To make the cubes easy to manipulate, the balance between tightness and looseness had to be perfect. The 54 outer surfaces of the individual pieces were given their colors, after several different decorative patterns using numbers and symbols were tried first. Despite the different combinations, none worked as well as the 6 colors that were eventually chosen. Once completed, Rubik demonstrated the puzzle to his students and friends, and the rest is history. Rubik's Cube made its international debut in 1980 at toy fairs in London, Paris, Nuremberg, and New York City, and quickly became a 1980's icon.
The first world championship took place on June 5, 1982 in Budapest. Nineteen contestants took part in the event. The cubes were scrambled by computer, then brought to the site of the competition in sealed cases. The competitors had 15 seconds to examine their cube before starting to solve the puzzle. The winner with the best time was the United States' Minh Thai, with an official time of 22.95 seconds. Since then, several cubists have been known to solve the puzzle in fewer than 20 seconds. It's interesting to note that it took Erno Rubik a full month to solve the puzzle himself. Among some of the lesser-known 'Cube Facts' is that one of the youngest to solve the Cube was a 7-year-old boy, Lars-Erik Anderson of Norway. He could repeatedly solve the puzzle, but couldn't explain how. Also, the Cube has 43,252,003,274,489,856,000 different possible configurations. If allowed one second for each turn, it would take 1,400 million million years to go through all of the possible configurations. By comparison, the universe is only 14 thousand million years old. After the craze of the early 1980's, the interest in Rubik's Cube diminished. However, with the advent of the Internet, cubomania seems to be re-appearing at an increasing rate. Regardless of the future of Rubik's Cube, one thing is sure: since its launch on the market in 1977, more than 200

million cubes have been sold, not including the many imitations and 'knock offs.'

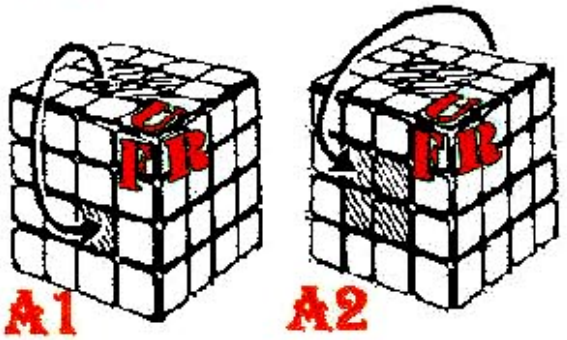
MAGIC CUBE 4x4x4

The basic stages of fast assembly.

Updating of a cube 3×3×3 is a cube 4×4×4, or "Master". In this puzzle the habitual cube has as though appeared cut on the center of sides on 4 parts. Instead of one there were two average layers, and operation of turn of an average layer "has forked". Instead of one central cube on each side became four. The device of the mechanism allowing cubes to move from a side on a side more complex. Instead of a cross the center of a cube-it is a sphere with grooves for moving the central cubes. Peripheral cubes which are kept central, slide directly on a surface of a sphere.For its description we use the designations accepted at us for a cube 3×3×3. Considering, that in a cube 4×4×4 instead of one there will be two average layers, operations of turn of an average layer here has changed, and **Rc<>L'c (Cr<>C'l)**.

Designations: **R** is there is a turn of the right side on 90 clockwise. **(RC)** is there is a turn of the right average layer. **(RRC)** is is turn of the right and right 2 average layers on 90 clockwise. **(R*2)** -it is turn on 180, double turn, **L '** - it is turn of the left side on 90 counter-clockwise. **(L'C)** is there is a turn of the left average, etc. Letters **F, U, B, D** designate accordingly turns of front, up, back, down sides. **C=Center**

1. The central cubes of a front side steal up process of moving of **algorithm 1**. The necessary cube should be preliminary deduced on the top side. **(RRC) U' (R'R'C)..... A1**
It is necessary to consider, that color of the central cubes should be defined on the chosen arrangement of angular and costal cubes, in pairs for sides **F-B, U-D, R-L**. It can appear, that color of the centers of last pair should be changed places. Algorithm **A2** changes color of the center of sides **F** and **B**
[(UC)*2 (R*2) (L*2)]*2 - (U*2)(D*2)..... A2

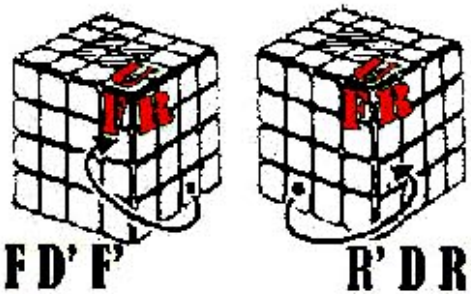


2. Costal cubes. Four pairs costal cubes of the top side steal up by means of connection of two cubes in one-colour pair. Turn of average layers and moving of the restored pairs on a place by means of turn of external layers is made. In figure it is shown how to connect costal cubes **fd** or **rd** in pair **fr**. **Algorithm A3** moves the necessary cubes from the bottom layer to average layers
R' D R and F D' F '..... A_31 and A_32

The third stage: the selection of 3 angular cubes of the top side does not differ from similar operations with a cube 3*3*3.

F D F '..... A_41

F ' D ' F..... A_42

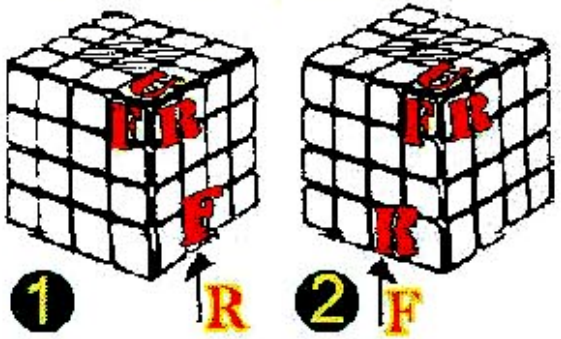


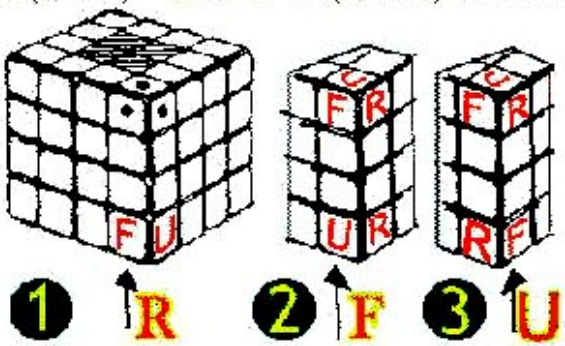
4. The fourth stage. The selection of six costal cubes of a belt (two average layers) Process occurs by means of turns **U, UC, D, DC** and operations **F D ' F '** and **R ' D R**. The free corner of the top side is used. First it is necessary to pick up on color three costal cubes on top average layer UC. It is necessary to find a costal cube on the bottom side and to translate it on top layer **UC** (look figure). If operations **F D ' F '** and **R ' D R** do not lead to the purpose you have chosen not that cube which is necessary, and its "double" who should pass in the bottom layer. The fourth cube yet do not install, leaving a free corner. As select three costal cubes of the bottom layer. Establish free angular and costal cubes from layers **U** and **UC** and the necessary cube in one layer. Then execute operations of moving from below to the right or from below on the left, that is..... **F D ' F '** or **R ' D R - A3 (algorithm A3).**

The fifth stage. Installation of two remained costal cubes of average layers. Put a cube in layer **UC** and restore the center (the description is given above). Then turn of the bottom side to bring a cube. It will come in one of two conditions shown in figure. Algorithm **A5** translates from position **№2** in position **№1**. Algorithm **A6** establishes last costal cube on a place.

D R D - F D' F R' A5

R (UC U) L D' L' D (U'U'C) R'..... A6





6. The sixth stage. Installation of the fourth angular cube of the top side.

Process **№1 [D F ' (D*2) F - D' F' D' F..... A7]** and process **№2 [D' F (D*2) F' - D F U F '..... A3]** put a cube on a place. The cube becomes correctly focused. Process **№3 [F D L D' L' F '.... A9]** brings a situation **№2** in a situation **№1**. Cuba which costs on a place, but it is incorrectly focused, it is established by algorithm **№7**. Three layers are picked up. There was one side.

7. The seventh stage. Angular cubes of last side are put into the order two steps:.

1) the Selection of corners, not paying attention to orientation. It does **algorithm №10** **(R' D' R) U (R' D R) U ' = m-U-m'-U '..... A10**. Replacing **U** on **U '** or on **(U*2)**, you receive various variants of process **A10**.

2) Orientation of corners of the bottom side are made with process **L D' L' F' D' F... (n)**

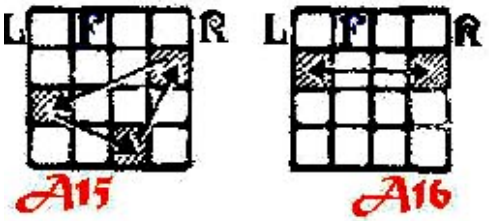
It touches only one corner of the top side, turning it counter-clockwise.
Return process **F' D F L D L' (n ')** turns a corner clockwise. Process **n-U-n'-U'** (**A11**) touches only two corners of the top side. This process allows to turn and focus consistently on color all angular cubes. It is possible to replace **U** on **U '** or (**U*2**) depending on pair angular cubes which should be unwrapped.

8. The eighth stage: a selection of costal cubes of the bottom layer.
The basic operation looks so: **(F_D'_F') U'C (F D F ') UC.... A12**. If to execute algorithm three times, it will return a cube in an initial condition. Having replaced In ' with on H'c, either on B2, or on BcHc, we shall receive set of variants of basic **algorithm A12**. Combining A12 with one or two rotations of external layers (examples in figure. **A13-A16**), completely we put in order last layer.

D [(F D' F ') (U'C) (F D F ') (UC)] D'..... A13
(L D' L') (DC) (L D L') (D'C)..... A14
D(L*2) (F D' F ') (UC)*2 (F D F ') (UC)*2 (L*2) D '..... A15

If at the final stage the situation, as in figure (**A16**) cubes can on be changed will turn out Places multirunning process **A16.**

F (U'C) F (LLC)*2 - F' (UC) F (LLC)*2 - F R' (DC) R (UC) R' (D'C) R (U'C) F (UC)... A16



The information on a site.

I want to devote this site **Geri Halliwell**, this girl is the finest in world. Having read through it, she finds out, that she has friends not only in the Great Britain, but also in Russia far from her. I hope to find out her personal opinion on a site. I hope, that my site has liked those who is familiar with this remarkable game and will tell new that who meets a cube the first time. Compositions 1-12 have been made by me personally, compositions have been taken from magazine " the Science and a life " №5 for 1983(from this magazine the basic information for a site has been taken)

My letter box

cube2007 @mail.ru__cat @rostel.ru__oleg.bujanov @gmail.com