

27.09.2013, Sergey Menshov & Valery Morozov special for <http://www.rubiks.com>

The 100% intuitive method for the Rubik's cube

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The 100% intuitive method for the Rubik's cube

In this manual I tell about solving the Rubik's Cube of any size by **method of Valery Morozov**. This method does not use formulas and is **intuitive for 100%**. I fully understood the principle of this method and added my ideas to it.

The Rubik's Cube 2x2x2 is base for solving cubes of any size

The sequence of solving:

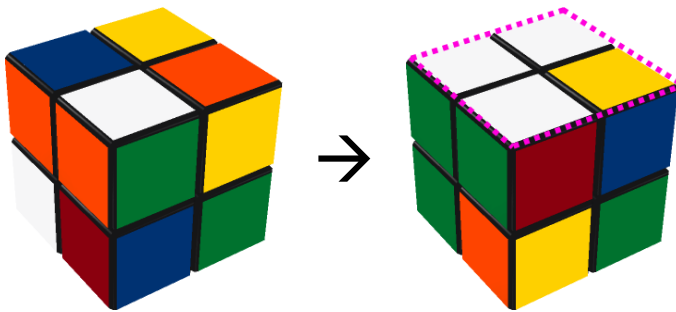
0. Choose two opposite colors on the cube, for example **White and Yellow**. These colors will be playing the **role of basic colors**. Note that **each the corner-piece (corner) contains the basic color** - White or Yellow.
1. On the top side you need to collect any 4 corners so as to their basic color be at the top. For example you can have 3 Yellow and 1 White colors on top side. Here we do not distinguish basic colors - **White is equals Yellow**.
2. On the bottom side you need to turn 4 corners so as to their basic color be at the bottom. **Your goal is collect all basic colors on Top and Bottom sides**.
3. **In this phase we will rotate vertical sides (Right, Left, Front or Back side) only on 180°**. The Top and the Bottom sides you can rotate on any angle. Your goal is collect on the Top side all corners with White color and on the Bottom side all corners with Yellow color.
4. You need put all corners into right place. In the result – **all 8 corners is solved (the cube 2x2x2 is solved)**.

Phase 0. Choose two opposite colors on the cube

Opposite colors on the classic Rubik's cube is White and Yellow, Red and Orange, Blue and Green. You can choose any of these pairs of colors. **In this manual I use White and Yellow colors as basic colors**.

Phase 1. Collect on the top side 4 any basic colors

This step is very simple and will not cause difficulty.



In this example on the Top side we have 3 White and 1 Yellow color. You can get another combination for example 2 Yellow and 2 White colors. Here we do not distinguish basic colors - **White is equals Yellow**.

The 100% intuitive method for solving the Rubik's cube of any size

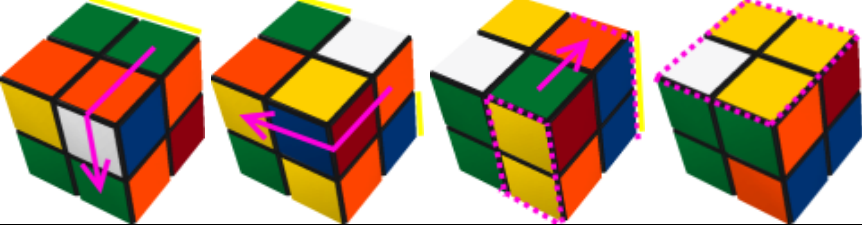
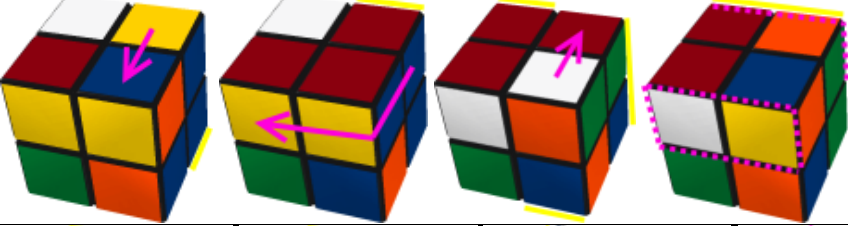

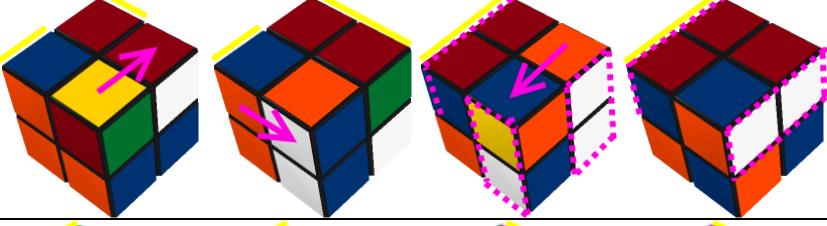
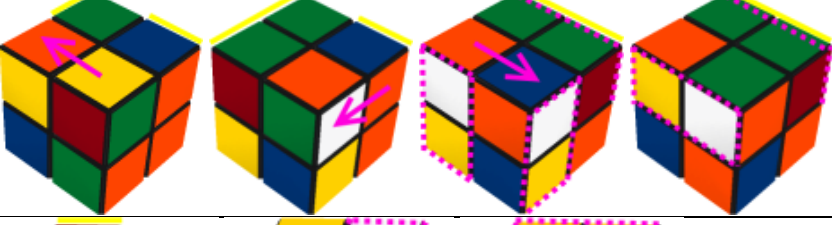
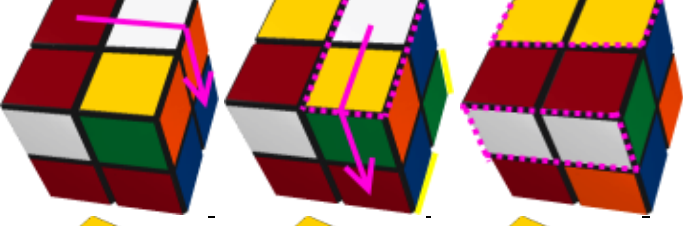
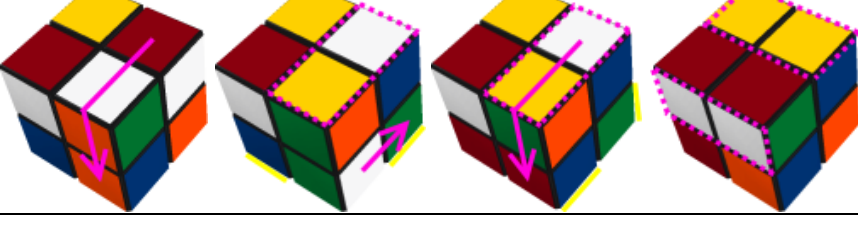
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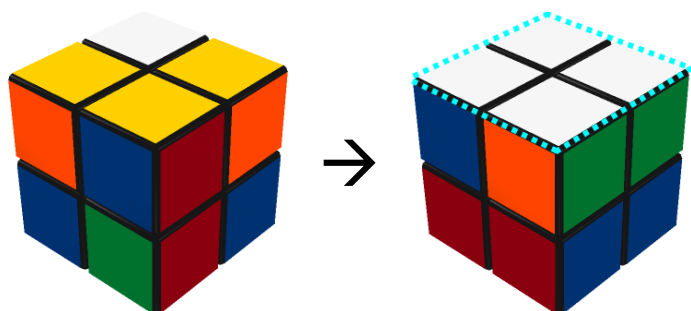
Phase 2. Turn 4 corners on the bottom side so as to their basic color be at the bottom

Take the cube bottom toward you. Here we can get only 6 situations, when not all basic color look to bottom (the location of the invisible basic colors are marked with yellow stripe):

No	Examples of solving	Result
1		All corners are turned!
2		go to Scheme 1.
3		go to Scheme 1.
4a		go to Scheme 1.
4b		go to Scheme 1.
5		go to Scheme 2.
6		go to Scheme 2.

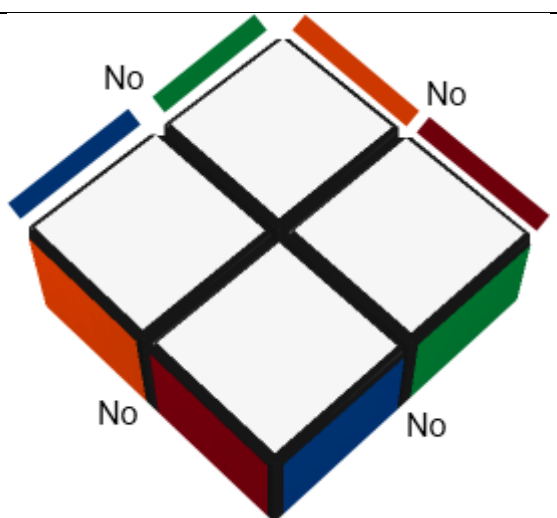
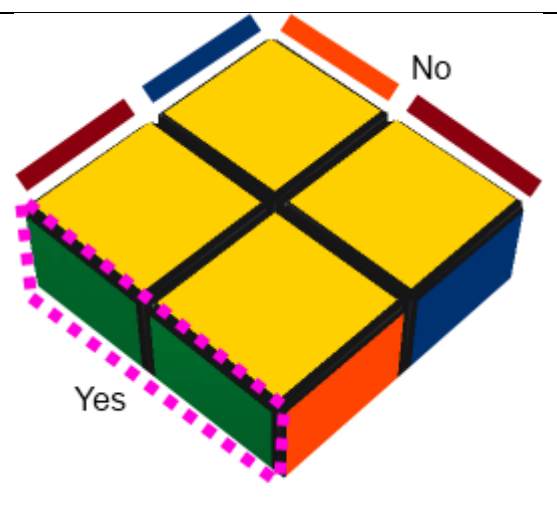
Phase 3. Collect White colors on the Top side and Yellow colors on the Bottom side

In this phase we will rotate vertical sides (Right, Left, Front or Back side) only on 180°. The Top and the Bottom sides you can rotate on any angle. This step is simple.



Phase 4. Put all corners into right place

We need to calculate how many pairs are correct and incorrect on the White side and on the Yellow side.

	
<p>On the White side we have no correct pairs (Red connected with Orange, Blue connected with Green). Two pairs are incorrect (Blue and Green or Red and Orange).</p>	<p>On the Yellow side we have one correct pair (Green connected with Green). If one pair is correct we look only on to the opposite pair. The opposite pair is incorrect (Red connected with Orange). One pair is correct and one pair is incorrect.</p>

We have 1 correct pair and 3 incorrect pairs.

The 100% intuitive method for solving the Rubik's cube of any size

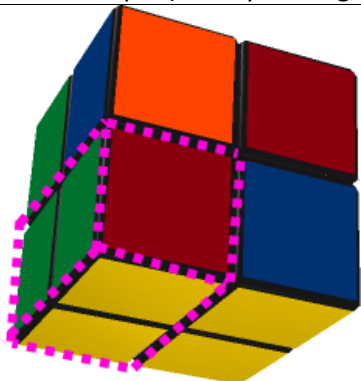
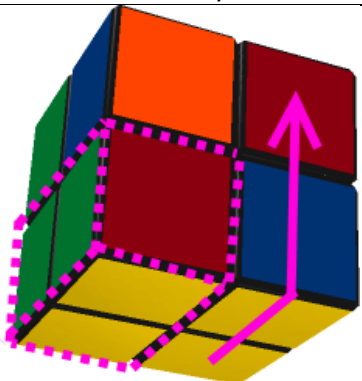
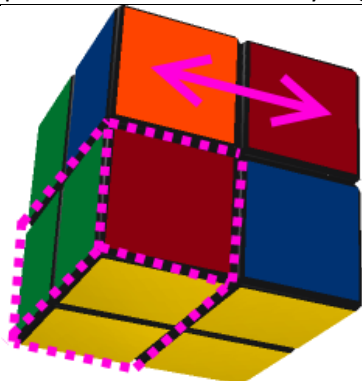
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Case 1. We have 1 pair is correct and 3 pairs are incorrect

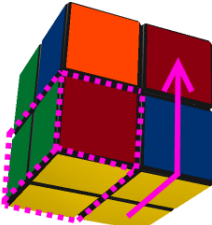
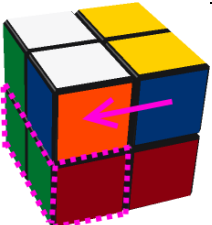
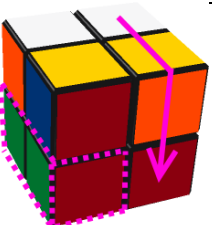
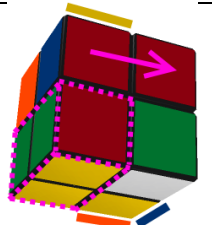
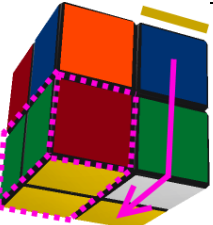
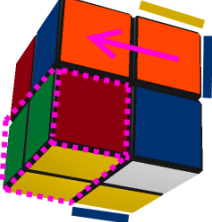
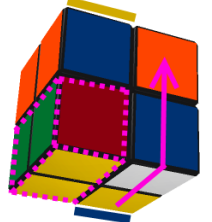
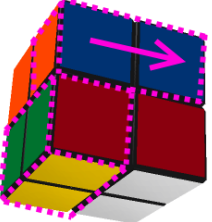
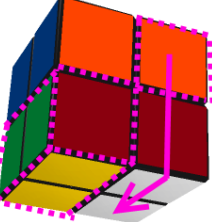
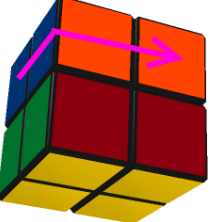
This situation is resolved as follows:

Hold the correct pair (in this example it the Green pair) with your fingers	Now we can rotate only 2 sides – the Right side and the Top side. The Right side can to rotate only on 180°. The Top side can to rotate on any angle.
	 

Under such conditions, we will solve any of the three incorrect pairs (Green pair on White side, Blue pair on White side, or Blue pair to Yellow side). **If we solve one pair, two other pairs will be solved automatically!**

To solve the pair we need to disconnect 2 corners that compose this pair, and after differently connect these corners.

For example, we will solve the Blue pair on the Yellow side:

Send the incorrect pair to the Top side. Rotate the right side on 180°	Rotate the top side on 90° to disconnect two Yellow elements.	Disconnect 2 wrong Yellow elements - Red and Orange. Rotate the right side on 180°	Put the blue color of the top yellow element on the Right side. Rotate the top side on 90°	Send it to the bottom side. Rotate the right side on 180°
				
Put the blue color of the top yellow element on the face. Rotate the top side on 90°	Connect two yellow elements (Blue to Blue). Rotate the right side on 180°	The Blue pair is solved. Rotate the top side on 90°	Send the first yellow pair to the second yellow pair. Rotate the right side on 180°	Turn the top side to its place
				

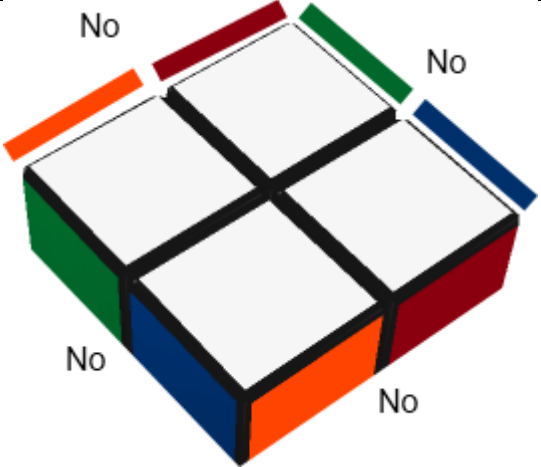
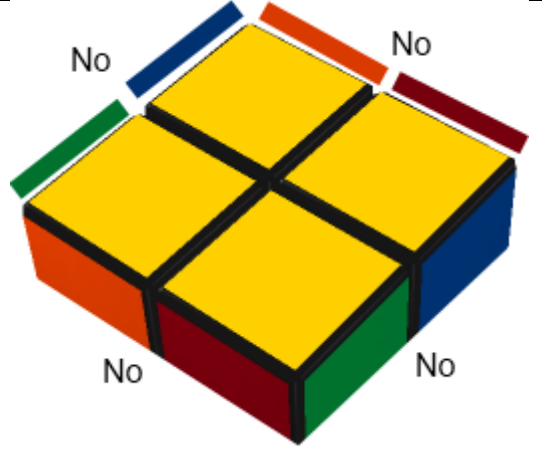
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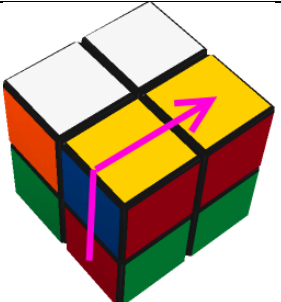

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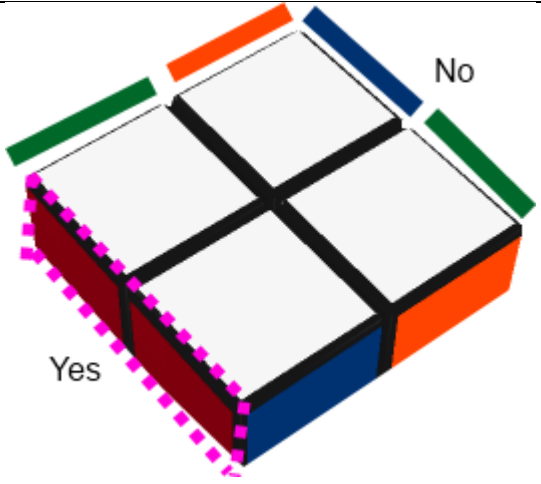
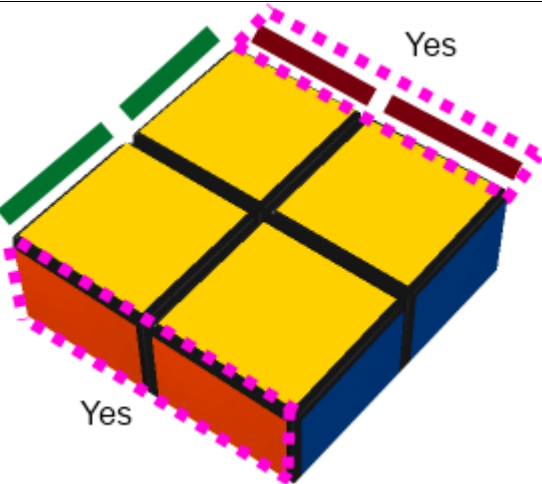
Case 2. We have 4 pairs are incorrect

	
<p>On the White side we have no correct pairs. Two pairs are incorrect (Blue and Green or Red and Orange).</p>	<p>On the Yellow side we have no correct pairs. Two pairs are incorrect (Blue and Green or Red and Orange).</p>

In this case we perform a next action:

Rotate the first side on 180°	Rotate the second side on 180°	Rotate the first side on 180°	Turn the top side to its place
			

Case 3. We have 3 pairs are correct and 1 pair is incorrect

	
<p>On the White side we have one correct pair (Red connected with Red). If one pair is correct we look only on to the opposite pair. The opposite pair is incorrect (Green connected with Blue). One pair is correct and one pair is incorrect.</p>	<p>On the Yellow side we have two correct pairs (Blue and Green or Red and Orange)</p>


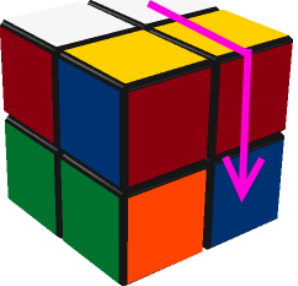
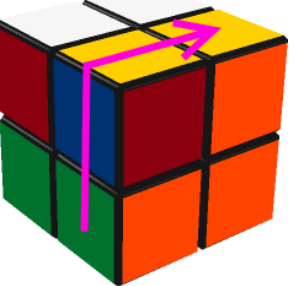
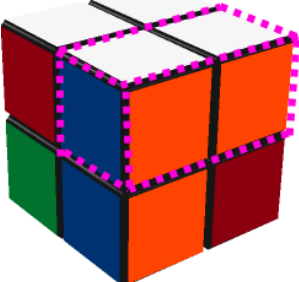
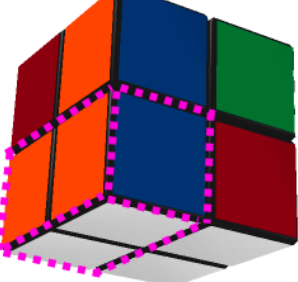
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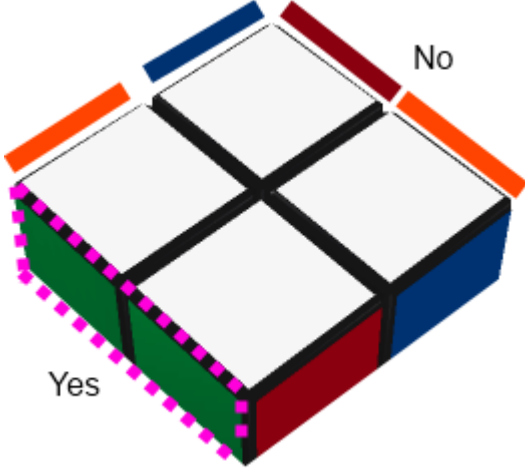
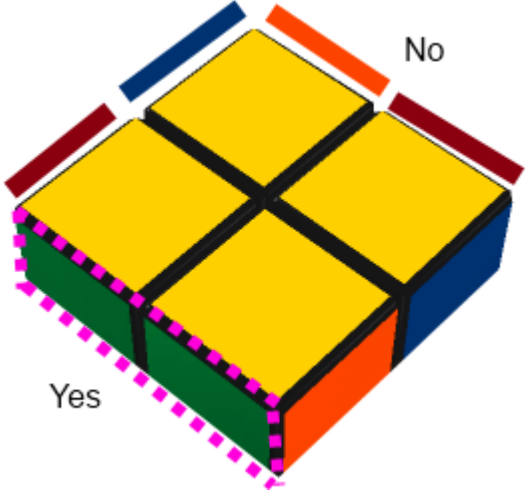
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In this case we perform the action from case 2:

Rotate the first side on 180°	Rotate the second side on 180°	Rotate the first side on 180°
		
We got the situation where 1 pair is correct and 3 pair are incorrect. Find the correct pair. In this example, it the Orange pair on the White side.	Hold the correct pair (in this example it the Orange pair) with your fingers and use action from case 1 «1 pair is correct, 3 pair are incorrect»	
		

Case 4. We have 2 pair is correct and 2 pair are incorrect

 <p>Yes</p>	 <p>No</p>
<p>On the White side we have one correct pair (Green connected with Green).</p> <p>If one pair is correct we look only on to the opposite pair.</p> <p>The opposite pair is incorrect (Red connected with Orange).</p> <p>One pair is correct and one pair is incorrect.</p>	<p>On the Yellow side we have one correct pair (Green connected with Green).</p> <p>If one pair is correct we look only on to the opposite pair.</p> <p>The opposite pair is incorrect (Red connected with Orange).</p> <p>One pair is correct and one pair is incorrect.</p>

Following situations are equal to this:

- 1) On the White side we have no correct pairs and On Yellow side we have two correct pairs.
- 2) On the White side we have two correct pairs and On Yellow side we have no correct pairs.

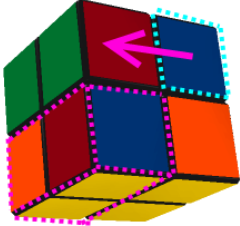

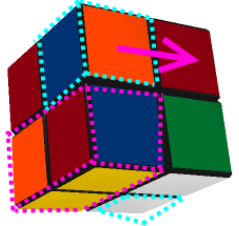
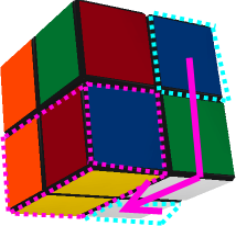
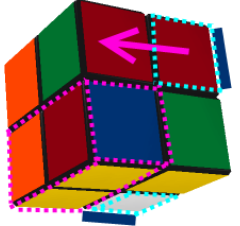

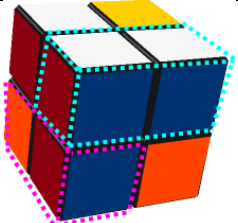
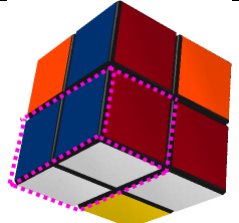
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All 3 cases are solved equally - Hold the any incorrect pair with your fingers. For example the incorrect Blue pair on the Yellow side. Under such conditions, we will solve second incorrect pair, in this example it the Blue pair on the White side.

Rotate the top side to disconnect two elements of second incorrect pair.	Disconnect 2 wrong White elements - Red and Orange. Rotate the right side on 180°	Put the blue color of the top white element on the Right side. Rotate the top side on 90°	Send it to the bottom side. Rotate the right side on 180°	Put the blue color of the top white element on the face. Rotate the top side on 90°
				
Connect two white elements (Blue to Blue). Rotate the right side on 180°	The Blue pair on the White side is solved.	Hold this pair (in this example it the Blue pair) with your fingers and use action from case 1 «1 pair is correct, 3 pair are incorrect»		
				

Solving the Rubik's Cube 3x3x3 by method of Valery Morozov

The sequence of solving:

0. Choose two opposite colors on the cube, for example **White and Yellow**. These colors will be playing the **role of basic colors**.
1. We will solve 8 corners (**this step is equals to solving the 2x2x2 cube**). Note that **each the corner-piece (corner) contains the basic color** - White or Yellow:
 - 1.1. On the top side you need to collect any 4 corners so as to their basic color be at the top. For example you can have 3 Yellow and 1 White colors on top side. Here we do not distinguish basic colors - **White is equals Yellow**.
 - 1.2. On the bottom side you need to turn 4 corners so as to their basic color be at the bottom. **Your goal is collect all basic colors on Top and Bottom sides**.
 - 1.3. **In this phase we will rotate vertical sides (Right, Left, Front or Back side) only on 180°**. The Top and the Bottom sides you can rotate on any angle. Your goal is collect on the Top side all corners with White color and on the Bottom side all corners with Yellow color.
 - 1.4. You need put all corners into right place. In the result – **all 8 corners is solved (the cube 2x2x2 is solved)**.
2. **We will solve 4 edge-piece (edge) in the middle layer (layer is between the Top and the Bottom sides)**. Note that **these 4 edges do not contain the basic color**. At this phase, we must get rid of these 4 edges. **In the result – 4 columns are solved**.
3. We will solve another 8 edges, each of which contain the basic color - White or Yellow:
 - 3.1. Connect any 2 edges, so that they give a correct pair. Put this pair in its place. **In the result, we get two "U"**.
 - 3.2. We will add 2 any another edges (with basic color on top) on the side where is a lower part of two "U". In the result, on this side **all 4 edges with basic color on top**.
 - 3.3. **We analyze centers and turn 4 edges (with basic color on top) on the opposite side**. We calculate how many need degrees to put all centers to its place. If we need to rotate on 0, 180, 360 degrees then use a combination in which the position of the centers will not change. Else if we need to rotate on 90 or 270 degrees then use a combination that makes an extra rotate the middle layer on 90°.
 - 3.4. Connect 6 edges so they formed 3 correct pairs.
 - 3.5. Put 3 pairs to its place.
4. Put centers to its place. **The cube 3x3x3 is solved!**

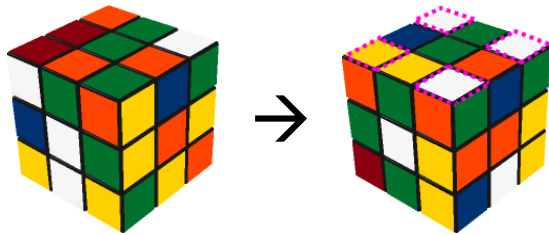
Phase 0. Choose two opposite colors on the cube

Opposite colors on the classic Rubik's cube is White and Yellow, Red and Orange, Blue and Green. You can choose any of these pairs of colors. **In this manual I use White and Yellow colors as basic colors.**

Phase 1. Solve corners

Step 1.1. Collect on the top side 4 any basic colors

This step is very simple and will not cause difficulty.



In this example on the Top side we have 3 White and 1 Yellow color. You can get another combination for example 2 Yellow and 2 White colors. Here we do not distinguish basic colors - **White is equals Yellow**.

Step 1.2. Turn 4 corners on the bottom side so as to their basic color be at the bottom

Take the cube bottom toward you. Here we can get only 6 situations, when not all basic color look to bottom (the location of the invisible basic colors are marked with yellow stripe):

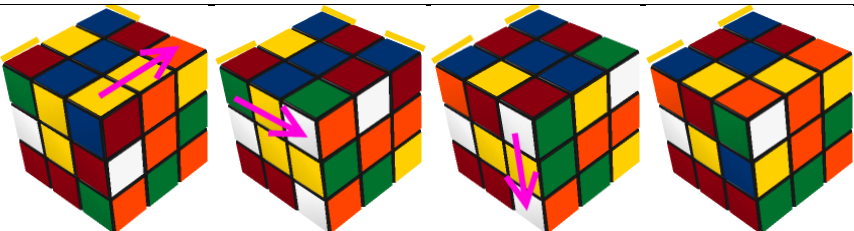
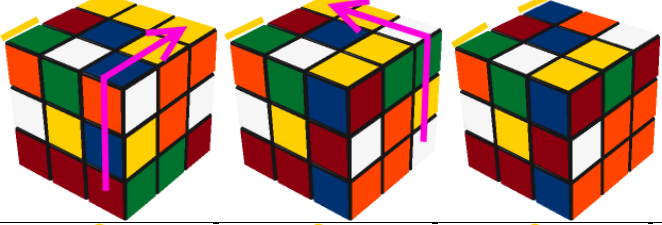
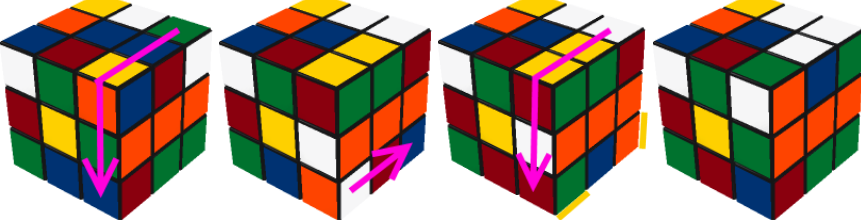
No	Examples of solving	Result
1		All corners are turned!
2		go to Scheme 1.
3		go to Scheme 1.
4a		go to Scheme 1.

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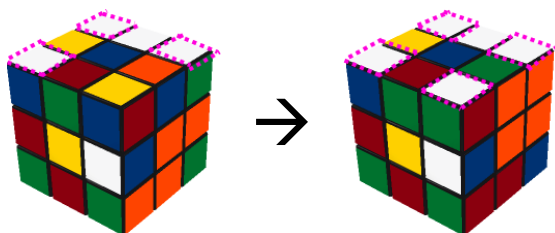
Author of manual: Sergey Menshov (Kazakhstan, Almaty) – menshov_s@mail.ru, http://www.youtube.com/channel/UCrSMIKMWAE4ug2ybiQo_P4A

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4b		go to Scheme 1.
5		go to Scheme 2.
6		go to Scheme 2.

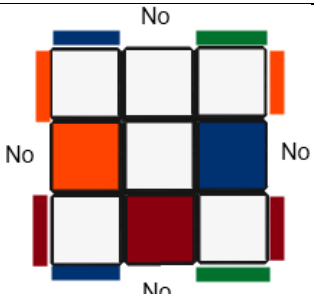
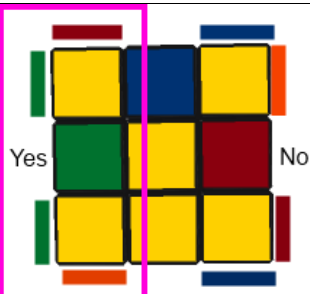
Step 1.3. Collect White colors on the Top side and Yellow colors on the Bottom side

In this step we will rotate vertical sides (Right, Left, Front or Back side) only on 180°. The Top and the Bottom sides you can rotate on any angle. This step is simple.



Step 1.4. Put all corners into right place

We need to calculate how many pairs are correct and incorrect on the White side and on the Yellow side.

	
<p>On the White side we have no correct pairs (Red connected with Orange, Blue connected with Green). Two pairs are incorrect (Blue and Green or Red and Orange).</p>	<p>On the Yellow side we have one correct pair (Green connected with Green). If one pair is correct we look only on to the opposite pair. The opposite pair is incorrect (Red connected with Orange). One pair is correct and one pair is incorrect.</p>

We have 1 correct pair and 3 incorrect pairs.

The 100% intuitive method for solving the Rubik's cube of any size

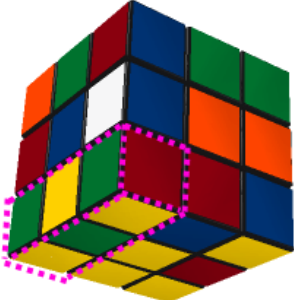
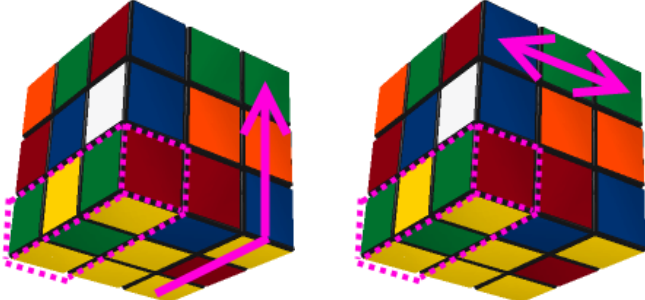
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Case 1. We have 1 pair is correct and 3 pairs are incorrect

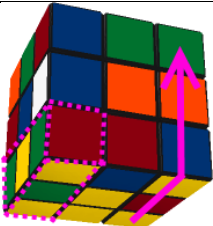
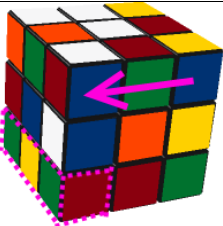

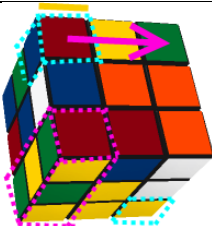
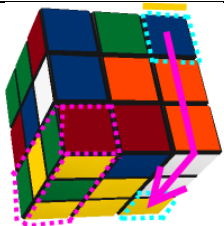
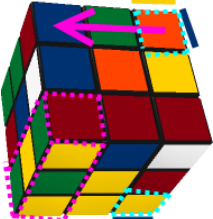

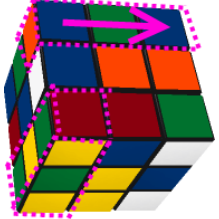
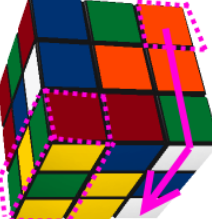
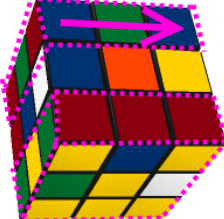
This situation is resolved as follows:

Hold the correct pair (in this example it the Green pair) with your fingers	Now we can rotate only 2 sides – the Right side and the Top side. The Right side can rotate only on 180°. The Top side can rotate on any angle.
	

Under such conditions, we will solve any of the three incorrect pairs (Green pair on White side, Blue pair on White side, or Blue pair to Yellow side). **If we solve one pair, two other pairs will be solved automatically!**

To solve the pair we need to disconnect 2 corners that compose this pair, and after differently connect these corners.

For example, we will solve the Blue pair on the Yellow side:

Send the incorrect pair to the Top side. Rotate the right side on 180°	Rotate the top side on 90° to disconnect two Yellow elements.	Disconnect 2 wrong Yellow elements - Red and Orange. Rotate the right side on 180°	Put the blue color of the top yellow element on the Right side. Rotate the top side on 90°	Send it to the bottom side. Rotate the right side on 180°
				
Put the blue color of the top yellow element on the face. Rotate the top side on 90°	Connect two yellow elements (Blue to Blue). Rotate the right side on 180°	The Blue pair is solved. Rotate the top side on 90°	Send the first yellow pair to the second yellow pair. Rotate the right side on 180°	Turn the top side to its place
				

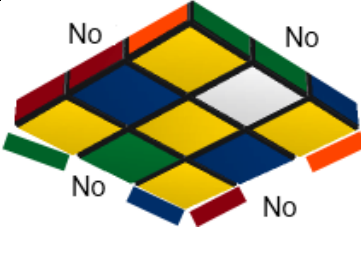
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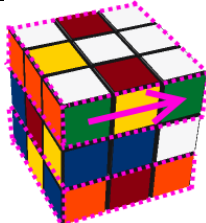
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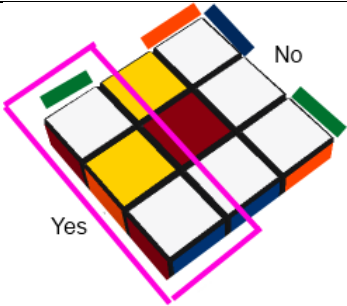
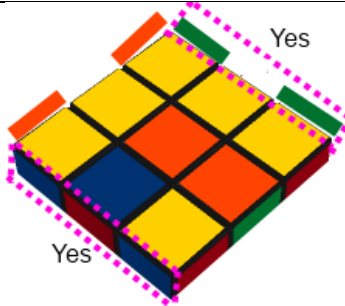
Case 2. We have 4 pairs are incorrect

	
<p>On the White side we have no correct pairs. Two pairs are incorrect (Blue and Green or Red and Orange).</p>	<p>On the Yellow side we have no correct pairs. Two pairs are incorrect (Blue and Green or Red and Orange).</p>





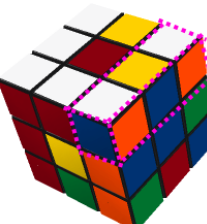

In this case we perform a next action:

Rotate the first side on 180°	Rotate the second side on 180°	Rotate the first side on 180°	Turn the top side to its place
			

Case 3. We have 3 pairs are correct and 1 pair is incorrect

	
<p>On the White side we have one correct pair (Red connected with Red). If one pair is correct we look only on to the opposite pair. The opposite pair is incorrect (Green connected with Blue). One pair is correct and one pair is incorrect.</p>	<p>On the Yellow side we have two correct pairs (Blue and Green or Red and Orange)</p>

In this case we perform the action from case 2:

Rotate the first side on 180°	Rotate the second side on 180°	Rotate the first side on 180°
		
<p>We got the situation where 1 pair is correct and 3 pair are incorrect.</p>	<p>Find the correct pair. In this example, it the Orange pair on the White side.</p>	<p>Hold the correct pair (in this example it the Orange pair) with your fingers and use action from case 1 «1 pair is correct, 3 pair are incorrect»</p>
		

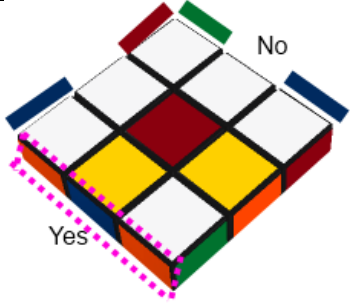
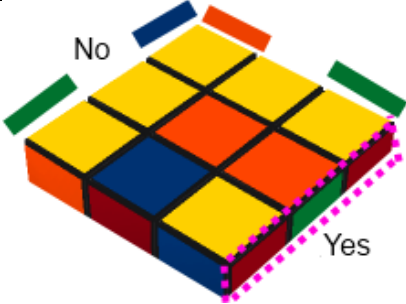
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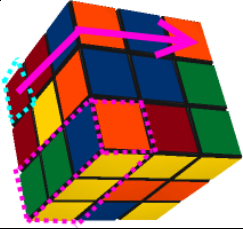
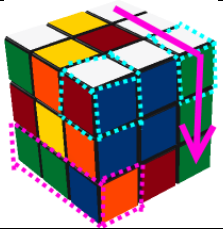
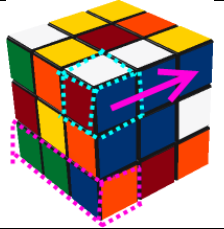
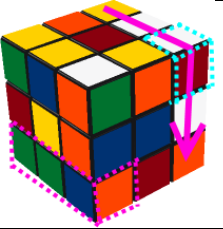


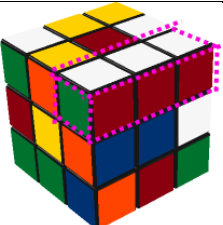
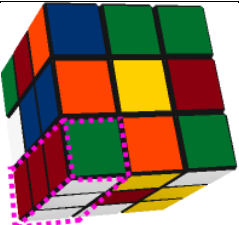
Case 4. We have 2 pair is correct and 2 pair are incorrect

	
<p>On the White side we have one correct pair (Orange connected with Orange). If one pair is correct we look only on to the opposite pair. The opposite pair is incorrect (Green connected with Blue). One pair is correct and one pair is incorrect.</p>	<p>On the Yellow side we have one correct pair (Red connected with Red). If one pair is correct we look only on to the opposite pair. The opposite pair is incorrect (Green connected with Blue). One pair is correct and one pair is incorrect.</p>

Following situations are equal to this:

- 1) On the White side we have no correct pairs and On Yellow side we have two correct pairs.
- 2) On the White side we have two correct pairs and On Yellow side we have no correct pairs.

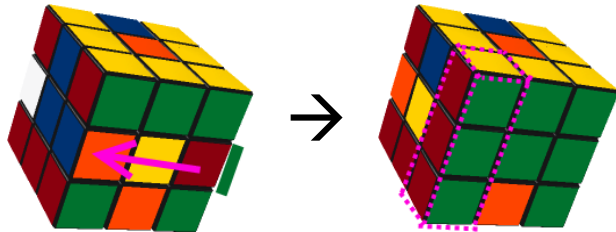
All 3 cases are solved equally - Hold the any incorrect pair with your fingers. For example the incorrect Orange pair on the Yellow side. Under such conditions, we will solve second incorrect pair, in this example it the Red pair on the White side.

<p>Rotate the top side to disconnect two elements of second incorrect pair.</p>	<p>Disconnect 2 wrong White elements - Green and Blue. Rotate the right side on 180°</p>	<p>Put the blue color of the top white element on the Right side. Rotate the top side on 90°</p>	<p>Send it to the bottom side. Rotate the right side on 180°</p>	<p>Put the red color of the top white element on the face. Rotate the top side on 90°</p>
				
<p>Connect two white elements (Red to Red). Rotate the right side on 180°</p>	<p>The Red pair on the White side is solved.</p>	<p>Hold this pair (in this example it the Red pair) with your fingers and use action from case 1 «1 pair is correct, 3 pair are incorrect»</p>		
				

Phase 2. Solve 4 columns

At this phase we need to put into place 4 edges which are located between the Top side and the Bottom side, it is Blue-Red, Blue-Orange, Green-Red and Green-Orange edges, i.e. all edges without basic colors.

If necessary edge is on the middle layer, then try to put it to its place:



The case where the two edges are not in their place (2 columns are yet not solved)

Remove the edge from the way	Put the place for this edge	Put the edge to its place	Column is solved. Return the side.	

How do rotate a layer, select empirically:

Put the place for this edge	Put the edge to its place	Column is solved. Return the side.

The case where one of the edge on the place (i.e. one column solved)

Temporarily remove the solved column from the way	Put the place for this edge	Put the edge to its place	Column is solved. Return the side.	Return the first solved column

If necessary edge is already in its place but wrong deployed, then we take out this edge from its place. Now put this edge properly.


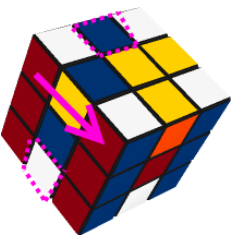

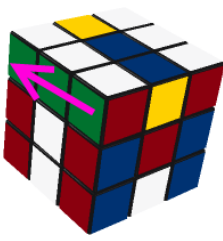
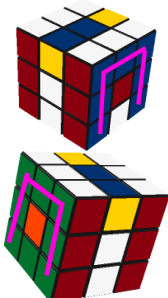
This step is quite easy and it can be solved in many ways.

Phase 3. Solve another 8 edges

Step 3.1. Connect any 2 edges, so that they give a correct pair (we get two "U")

This is quite easily, and you can use any turns of the middle layers and auxiliary turns of the Top side and the Bottom side.

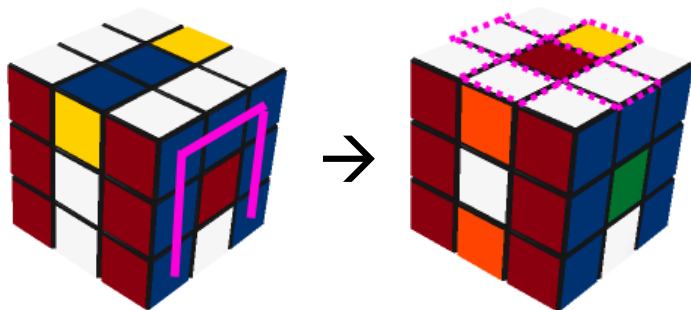
For example connect the White-Blue edge and the White-Green edge (these give correct pair):

Put the White-Blue edge so that it will connect with White-Green edge	Rotate the top side and connect 2 edges to give the correct pair	Put this pair to its place. If need then temporarily hide it on top or bottom side and after put it to its place.	Do not forget to return the corners to the place	In the result, we get two "U"
				

After that we must solve 6 edges that form 3 pairs.

Step 3.2. Add 2 any another edges (with basic color on top)

This step like step 1.1 only is applicable to edges.



In the result, on this side all 4 edges with basic color on top.

Take cube so that two "U" stand correctly. After that we will rotate only 2 layers – the middle layer (located between two "U") and the top side..



On this picture two «U» is solved on the Orange side and the Red side.

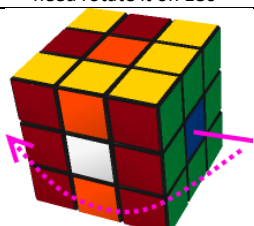
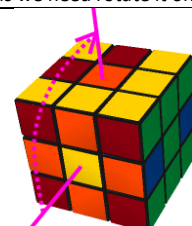
If you not solve two "U" then put any 4 edge to the top side or to the bottom side with basic color on top. In this case we must solve 8 edges that form 4 pairs.

Solving two "U" is optimization for this method.

Step 3.3. Turn 4 edges (with basic color on top) on the opposite side

We calculate how many need degrees to put all centers to its place. If we need to rotate on 0, 180, 360 degrees then use a combination in which the position of the centers will not change. Else if we need to rotate on 90 or 270 degrees then use a combination that makes an extra rotate the middle layer on 90°.

Mentally we do turns and calculate:

For correct setup the Blue-Green axis we need rotate it on 180°	Now, for correct setup the White-Yellow axis we need rotate it on 90°
	

Total: $180^\circ + 90^\circ = 270^\circ$.

If the axis is turned on 180° (like this example where the blue center is on the green side) then it can counted as 0°. For this example: $0^\circ + 90^\circ = 90^\circ$.

In the step 3.3 two «U» are solved on the Blue side and the Green side and we rotate middle layer between them!

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Step 3.3.1. The axes are offset on: 0° , 180° , 360°

Case 1 (2 basic colors on opposite edges):

Turn the top side so as to put 2 edges with basic color on the Right side and the Left side. Rotate the middle layer on 90° .	Rotate the top side on 90° . Thereby we break the pair of edges located on the front side.	Return the middle layer. Rotate it on 90° .	Send the edge which basic color (it only one) to the back side. Rotate the top side on 90° .	We will send to the top side the pair of basic colors on the front side. Rotate the middle layer on 90° .
Rotate the top side on 90° .	On the front side and the back side we get the 2 connected pairs of basic colors. Rotate middle layer on 90° and put them on the top side and the bottom side.	Turn the top side to its place.	All the edges is turned with basic colors to top side	

Case 2 (2 basic colors on neighbor edges):

Turn the top side so as to put 2 edges with basic color on the Front side and the Left side. Rotate the middle layer on 90° .	Rotate the top side on 90° . Thereby we break the pair of edges located on the front side.	Return the middle layer. Rotate it on 90° .	Send the edge which basic color (it only one) to the back side. Rotate the top side on 180° .	We will send to the top side the pair of basic colors on the front side. Rotate the middle layer on 90° .
Rotate the top side on 90° .	On the front side and the back side we get the 2 connected pairs of basic colors. Rotate middle layer on 90° and put them on the top side and the bottom side.	Turn the top side to its place.	All the edges is turned with basic colors to top side	

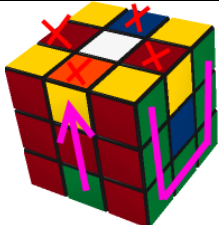
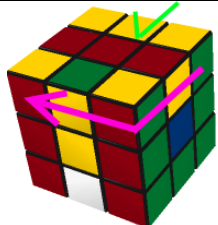
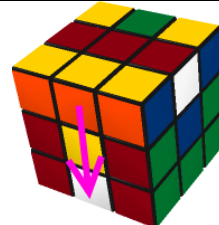
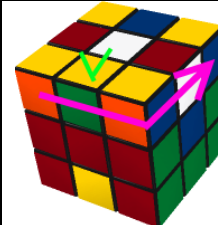
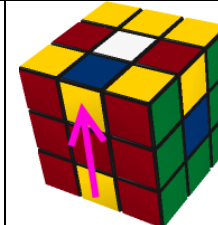
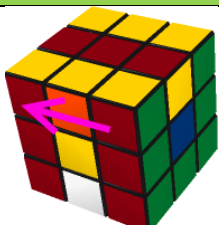
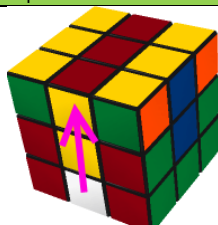
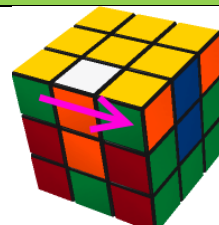
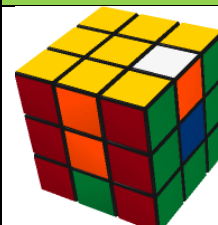
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Case 3 (no basic colors on top edges):

Rotate the middle layer on 90°.	Rotate the top side on 180°. Thereby we break the pair of edges located on the front side.	Return the middle layer. Rotate it on 90°.	Send the edge which basic color (it only one) to the back side. Rotate the top side on 180°.	We will send to the top side the pair of basic colors on the front side. Rotate the middle layer on 90°.
				
Rotate the top side on 90°.	On the front side and the back side we get the 2 connected pairs of basic colors. Rotate middle layer on 90° and put them on the top side and the bottom side.	Turn the top side to its place.	All the edges is turned with basic colors to top side	
				

Case 4. In the case where all edges with basic colors, then this step is skipped.

The 100% intuitive method for solving the Rubik's cube of any size

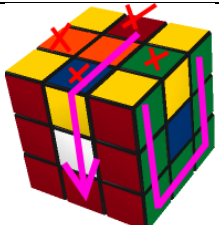
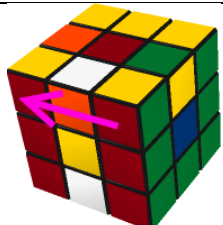
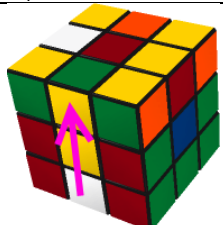
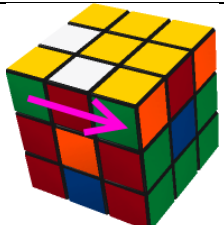
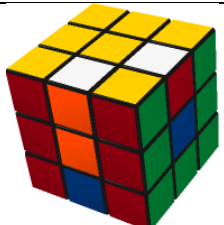
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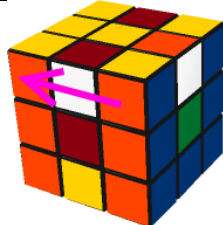
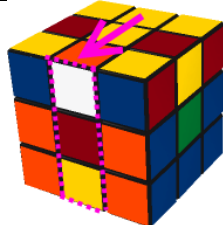
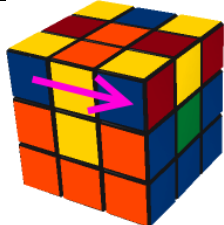
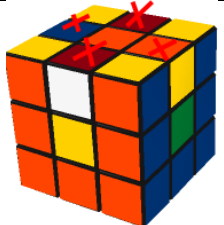
20

Step 3.3.2. The axes are offset on: 90° , 270°

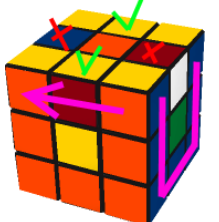
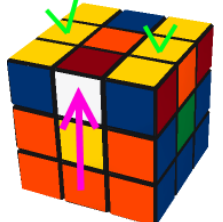

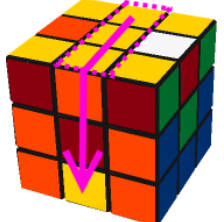
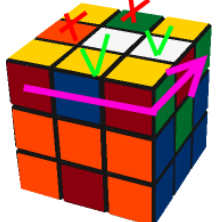
Case 1. (no basic colors on top edges):

Rotate the middle layer on 180° , thereby transferring one pair of basic colors to the top side.	Rotate the top side on 90° , thus putting the whole pair above whole and the broken pair above broken.	On the front side and the back side we get the 2 connected pairs of basic colors. Rotate middle layer on 90° and put them on the top side and the bottom side.	Turn the top side to its place.	All the edges is turned with basic colors to top side. Axis is turned on 90°.
				

Case 2 (2 basic colors on neighbor edges):

Turn the top side so as to put 2 edges with basic color on the Front side and the Left side. Rotate the middle layer on 90° .	Rotate the top side on 90° thereby two edges connect on the front side	Return the middle layer. Rotate it on 90° .	Turn the top side to its place.	We get case 1 (3.3.2, Case 1)
				

Case 3 (2 basic colors on opposite edges):

Turn the top side so as to put 2 edges with basic color on the Right side and the Left side. Rotate the middle layer on 90° .	Rotate the middle layer on 90° .	Rotate the top side on 90°	Send the whole pair to the bottom side. Rotate the middle layer on 180° .	We get case 2 from step 3.3.1 (3.3.1, Case 2)
				

Case 4. In the case where all edges with basic colors, then perform the action «3.3.2, Case 1» (after this axis is turned on 90°) and after perform action «3.3.1, Case 3».

The 100% intuitive method for solving the Rubik's cube of any size

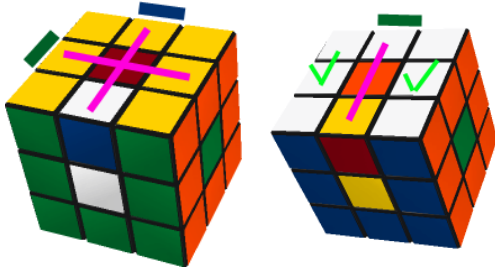
Author of method: Valery Morozov (Russia, Moscow) – mva52971@gmail.com, <http://www.youtube.com/channel/UCJvgMgLx9GzpuVFNQB6c3vQ>

Author of manual: Sergey Menshov (Kazakhstan, Almaty) – menshov_s@mail.ru, http://www.youtube.com/channel/UCrSMIKMWAE4ug2ybiQo_P4A

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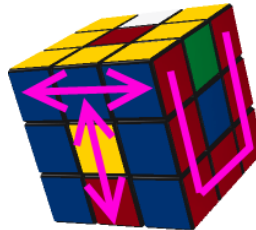
Step 3.4. Connect 6 edges so they formed 3 correct pairs

For example, we need to connect next 6 edges:



We need to connect the White-Green edge with the White-Blue edge, the Yellow-Red edge with the Yellow-Orange edge and the Yellow-Blue edge with the Yellow-Green edge. In the result we get correct pairs of edges.

We can rotate only two layers, the layer between two "U" and the top side. Here two «U» is solved on the Red side and the Orange side.



Send the first necessary edge to the top side and the second necessary edge to the bottom side.

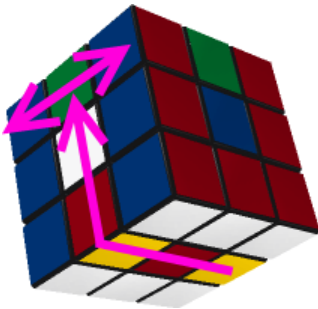
For example, we connect the Yellow-Green edge with the Yellow-Blue edge:

Send one edge to the bottom side using the rotation of the middle layer (the layer between two "U") on 180°.	Rotate the top side so that the elements were on opposite sides. In this case, rotate the top side on 90°.	Rotate the Front side on 180° and connect the Yellow-Blue edge and the Yellow-Green edge.	Hide the correct pair on the Front side. Rotate the middle layer on 90°.	Return the front side and rotate the correct pair on 180°
Send the correct pair to the top side. Rotate middle layer on 90°	The same way we connect 2 another pairs. In this case the White-Blue edge with the White-Green edge and the Yellow-Red edge with the Yellow-Orange edge. Put the White-Green edge in the same way.	Again rotate the front side on 180°. In the result, we connected at once two pairs.	The first pair on the top side contain the Yellow-Orange edge and the Yellow-Red edge. The second pair on the bottom side contain the White-Blue edge and the White-Green edge. Again hides the correct pair on the Front side. Rotate middle layer on 90°.	Again return the front side and rotate the correct pair on 180°

Again send the correct pair to the top side. Rotate middle layer on 90°	All edges is connected!

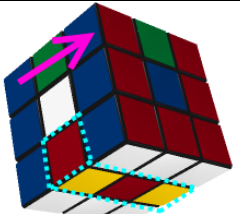
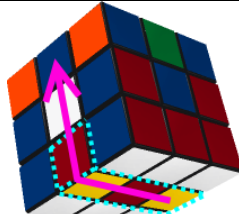
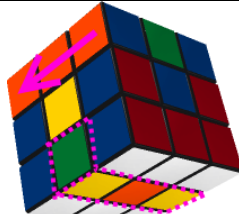
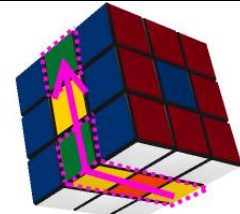
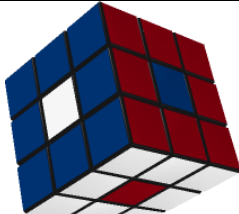
Step 3.5. Put 3 pairs to its place

We will rotate the top side and put the place for the pair on the bottom side. After this we put the bottom pair to its place.



We will rotate the top side on any angle and the middle layer only on 180°.

Let's do it:

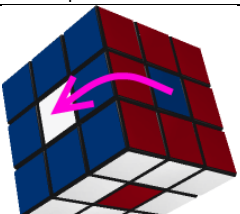
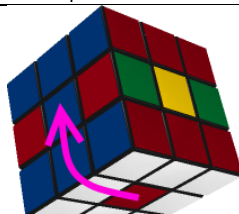
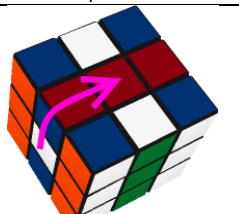
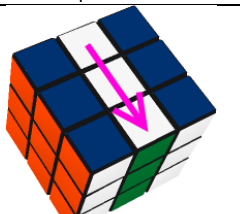
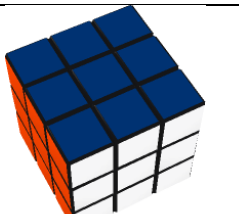
Put the place for the Yellow-Orange and Yellow-Red pair	Rotate middle layer on 180° and put the pair to place	Other pair goes to bottom side. On top side put the place for the Yellow-Green and Yellow-Blue pair	Rotate middle layer on 180° and put the pair to place	All pairs are put to places!
				

Phase 4. Put centers to its place

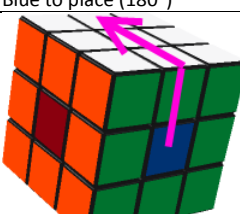
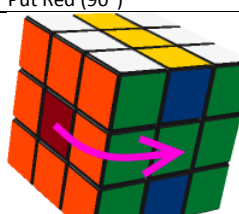
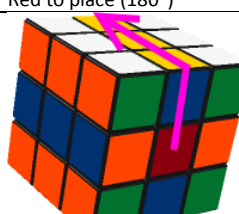
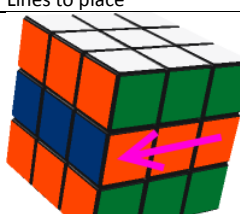
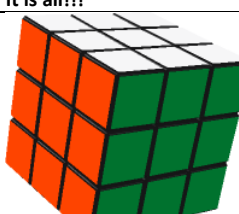
There are only 3 cases:

- 1) All centers not on their places;
- 2) 2 centers on their places and 4 is not;
- 3) All centers on their places.

Case 1. All centers not on their places

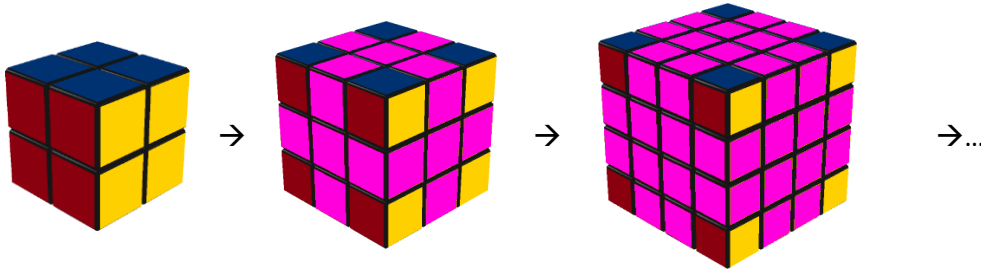
Blue to place	Red to place	White to place	Lines to place	It is all!!!
				

Case 2. 2 centers on their places and 4 is not

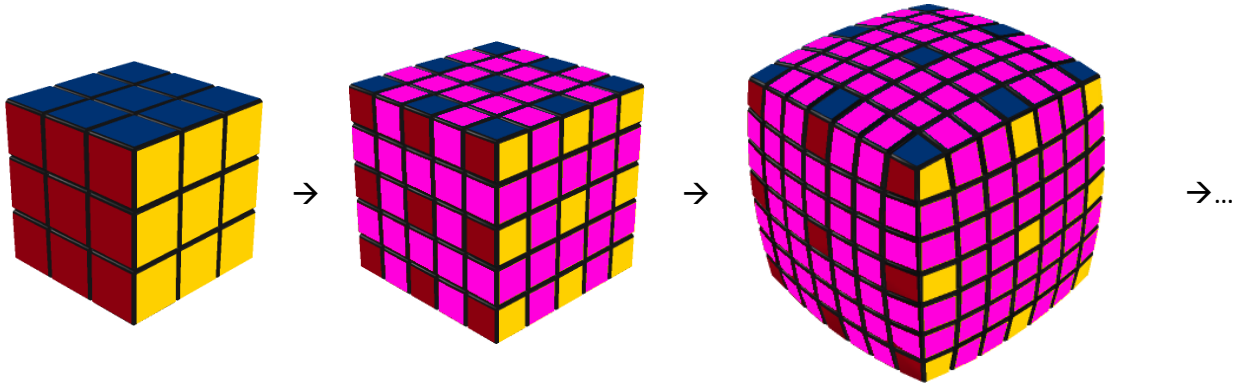
Blue to place (180°)	Put Red (90°)	Red to place (180°)	Lines to place	It is all!!!
				

About Rubik's cubes of the big size

8 corners elements (contains 3 colors) on cubes of all sizes are equal:



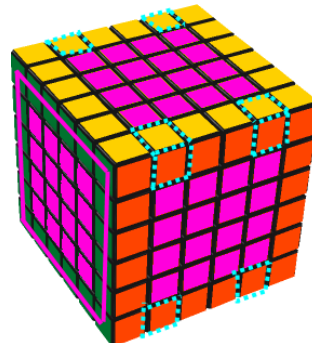
Central edges and centers on cubes with an odd number of layers we solve as the 3x3x3 cube:



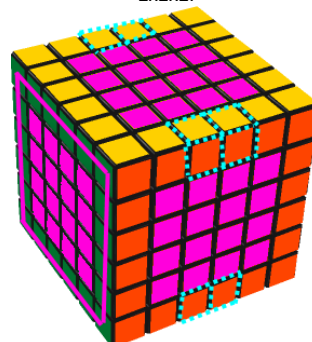
If on big cubes we collect 2 frames (2 letters "O") on opposite sides (such as the Green side and the Blue side), then 8 adjacent edges give the cube 2x2x2 only with invisible right and left sides:

The cube 6x6x6 contains 2 such cubes 2x2x2, and we solve it in two steps.

Step 1. We solve the first cube 2x2x2.



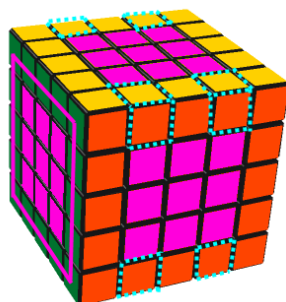
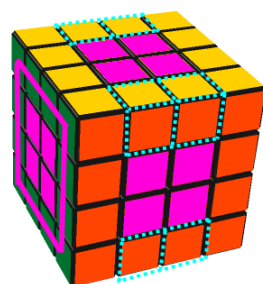
Step 2. We solve the second cube 2x2x2.



Take the cube 2x2x2

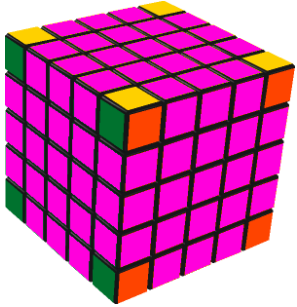
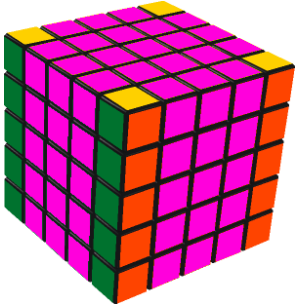
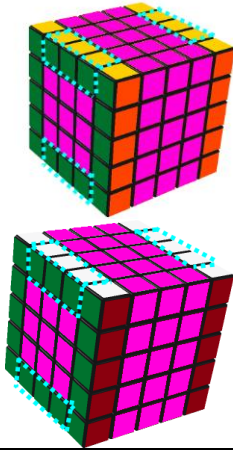
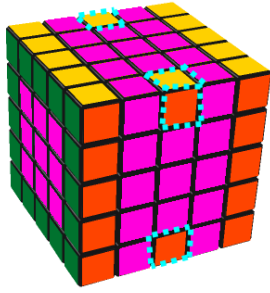
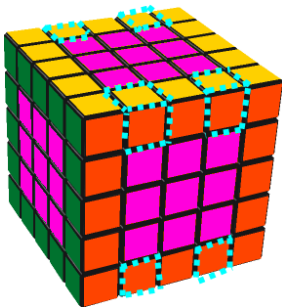
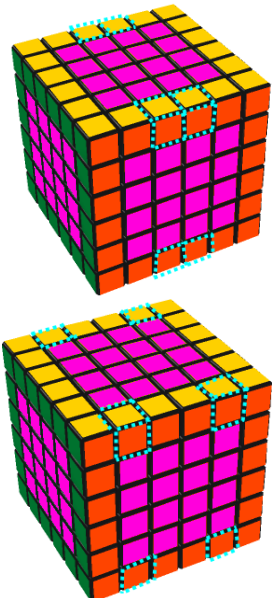
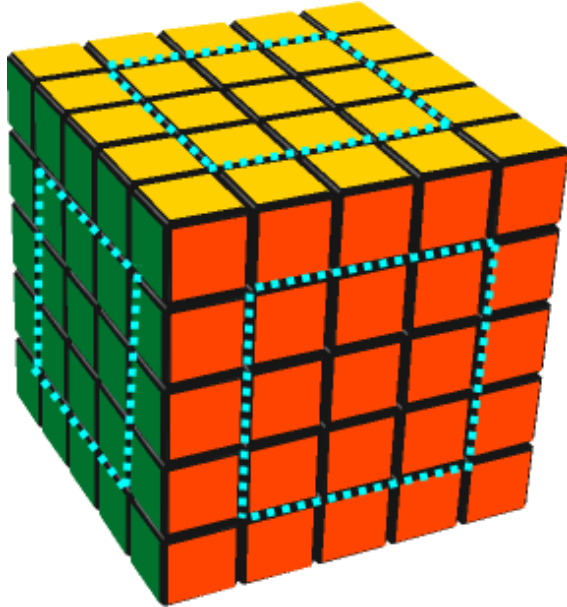


And pretend that it does not have the right and the left side, i.e. these sides can not put elements



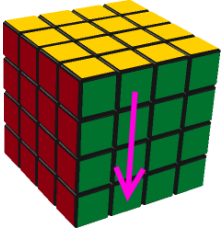
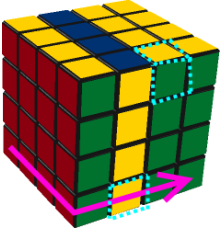
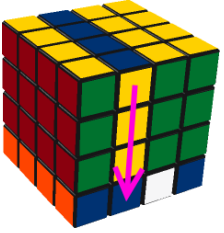
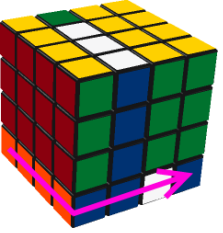
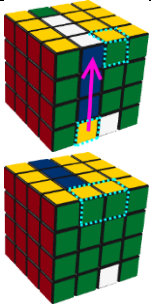
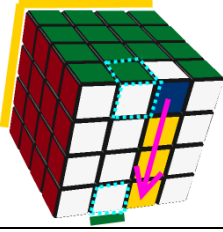

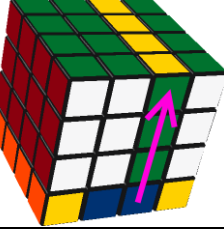
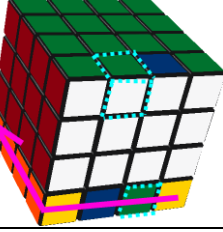
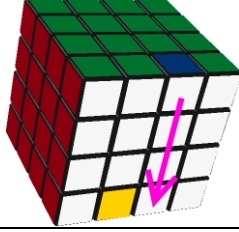
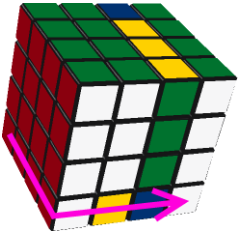
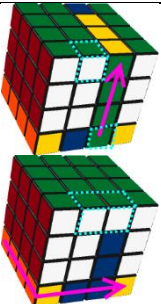
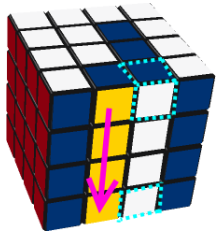
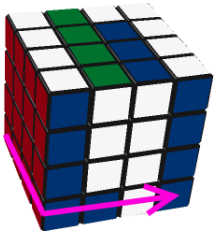
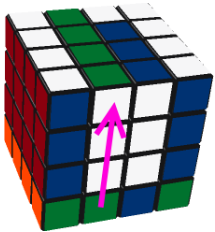

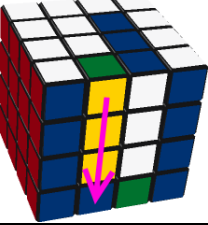
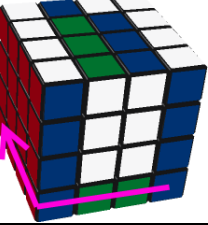
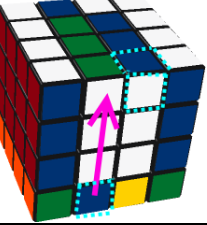
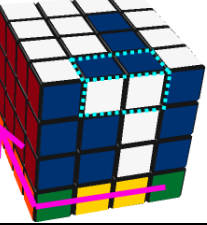
The sequence of solving big cubes

Here White and Yellow colors are basic colors.

<p>Solving 8 corners as cube 2x2x2</p>	<p>Solving 4 columns. Put edges without basic color to their places. This phase equals to phase 2 for cube 3x3x3.</p>	<p>Solve other 4 ribs and put them to their places. In the result, we get two «O» (on the Green side and the Blue side).</p>	<p>Solve central edges (if them exists). They solving as edges on the cube 3x3x3</p>
			
<p>Step by step we solve 8 adjacent edges:</p> <ol style="list-style-type: none"> 1) Connect edges as the cube 2x2x2; 2) If we have got the parity, then we rotate one layer on 90° and again resolve 8 edges as the cube 2x2x2; 3) Turn 4 edges as the cube 3x3x3 (see step 3.3.1 or 3.3.2) 4) Connect 6 edges so they formed 3 correct pairs as the cube 3x3x3 (see step 3.4) 5) Put 3 pairs to its place as the cube 3x3x3 (see step 3.5) 6) Exchange 2 ribs if this needs 		<p>Permutation of central elements.</p>	
	<p>For cube 6x6x6, we must solve step by step 2 groups of 8 elements</p> 		

Variant of the solving 4 edges on principle 2x2x2 and what is a «parity»

For making the parity, we rotate one part of middle layer on 90°. After this we resolve ribs with new location of the central layers.

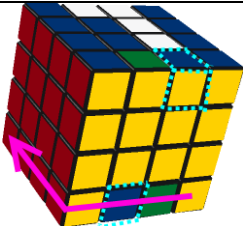
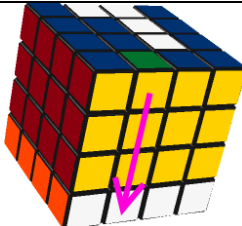
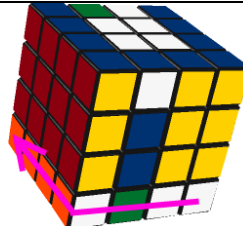
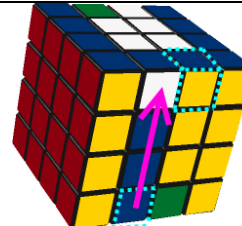
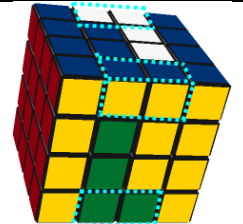
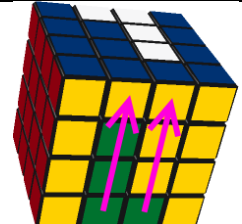
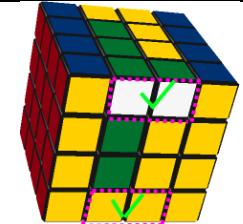
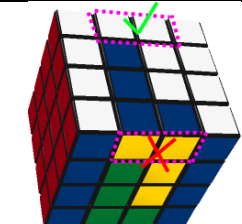
Rotate one part of middle layer on 90°. In the result all 4 ribs are broken.	Step by step we connect all ribs with new location of the central layers. We begin with Yellow-Green rib. Rotate the bottom side on 180° and put the bottom Yellow-Green element on the right part of middle layer.	Put the place for the bottom Yellow-Green element. Rotate the left part of middle layer on 90°	Rotate the bottom side on 180° and put the Yellow-Green element to its place.	Connect 2 Yellow-Green elements. Rotate the left part of middle layer on 90°. After this we will rotate the cube and connect second rib.
				
We will connect White-Green elements. Put the place for the second element. If two elements are on the same part of middle layer, then we at once rotate the part of middle layer on 90°.	Rotate the bottom side on 180° and put the bottom White-Green element to the right part of middle layer.	The White-Green element on the bottom side makes first step to its place. Rotate the part of middle layer on 90°	Rotate the bottom side on 180° and put the bottom White-Green element to the left part of middle layer.	Put the place for the second element. Rotate the part of middle layer on 90°
				
Put White-Green element to its place. Rotate the bottom side on 180°	Connect 2 White-Green elements. Rotate the part of middle layer on 90°. After this we will rotate the cube and connect third rib.	We will connect White-Blue elements. Put the place for the second element. If two elements are on the same line, then we rotate the part of middle layer on 90°.	Rotate the bottom side on 180° and put the bottom White-Blue element to the left part of middle layer.	The White-Blue element on the bottom side makes first step to its place. Rotate the part of middle layer on 90°
				
Rotate the bottom side on 180° and put the bottom White-Blue element to the right part of middle layer.	Put the place for the second element. Rotate the part of middle layer on 90°	Put the White-Blue element to its place. Rotate the bottom side on 180°	Connect 2 White-Blue elements. Rotate the part of middle layer on 90°.	Return bottom side to place. After this we will rotate the cube and connect fourth rib.
				

The 100% intuitive method for solving the Rubik's cube of any size

Author of method: Valery Morozov (Russia, Moscow) – mva52971@gmail.com, <http://www.youtube.com/channel/UCJvgMgIx9GzpuVFNQB6c3vQ>

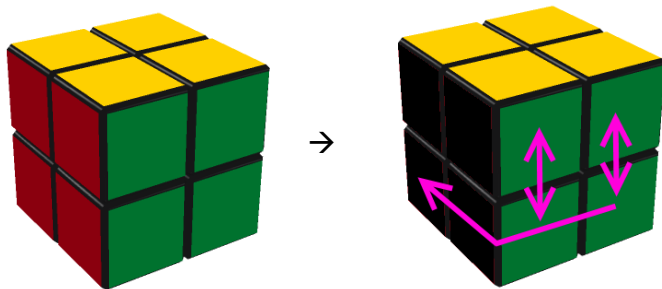
Author of manual: Sergey Menshov (Kazakhstan, Almaty) – menshov_s@mail.ru, http://www.youtube.com/channel/UCrSMIKMWAE4ug2ybiQo_P4A

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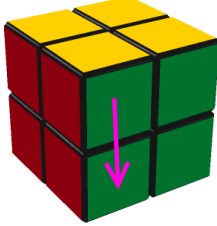
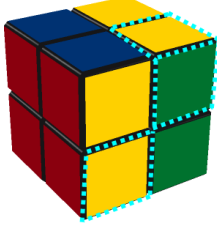
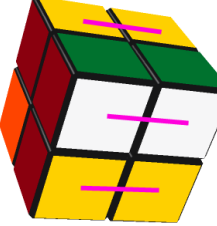
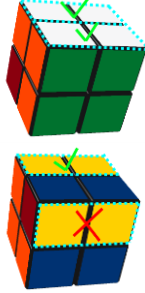
We will connect Yellow-Blue elements. If two elements are not on the same line, then we rotate the bottom side on 180°.	Put the place for the second element. Rotate the part of middle layer on 90°	Put the Yellow-Blue element to its place. Rotate the bottom side on 180°	Connect 2 White-Blue elements. Rotate the part of middle layer on 90°.
			
All edges are connected!	Now put 2 ribs with base color on the bottom side or the top side. In this case, we can rotate the middle layer on 90°.	We putted 2 elements with basic color to the Yellow side.	Look what happened on the opposite side. Here we have formed the "parity" - the first rib with basic colors, and the second without basic colors!
			

Accordingly for resolve of "parity" we may use the same principle, i.e. we rotate any part of the middle layer on 90° and after this we reconnect 8 edges with new location of the central layers.

As mentioned above, these 8 ribs give the cube 2x2x2 whose bottom side is rotated only on 180°, and the right side and the left side are rotated on any angle:



Having done a similar action on the cube 2x2x2, we get the following:

Rotate one part of middle layer on 90°	In the result all 4 ribs are broken.	Solving ribs	All edges are connected. For greater clarity, we put the White rib to the White rib and the Yellow rib to the Yellow rib.	As a result, we see on the White side both ribs are solved, on the Yellow side the first rib is solved and the second rib is broken.
		... We solve the first rib, the second rib, the third rib, the fourth rib. Rotate the bottom side only on 180° (we do not have the left side and right side) ...		

The 100% intuitive method for solving the Rubik's cube of any size

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The exchange scheme for two ribs

Sometimes in big cubes we can have the situation where two ribs not fell into place, in this case, you can exchange them, using the next movement:

Rotate the part of middle layer on 180°	Rotate top side on 180°. Put the place for the first Yellow pair.	Put the first pair on its place. Rotate the part of middle layer on 180°	Rotate top side on 180°. Put the place for the second Yellow pair.	Put the second pair on its place. Rotate the part of middle layer on 180°

The permutation principle of centers in big cubes

For permutation of any central elements in big cubes we use the permutation principle of centers on the cube 3x3x3:

Blue to Red place	Yellow to Blue place	Return first line to place	Return second line to place	We moved 6 central elements or 3 axis

The same as in the 3x3x3 cube, only with shifted coordinate axis.

Now we can do the next focus. Before returning axes to its place we perform substitution:

Rotate Yellow side on 90° and replace Red center on axis to Yellow center	Return the first axis to place	Return the second axis to place	Blue center to place	Return two layers to places

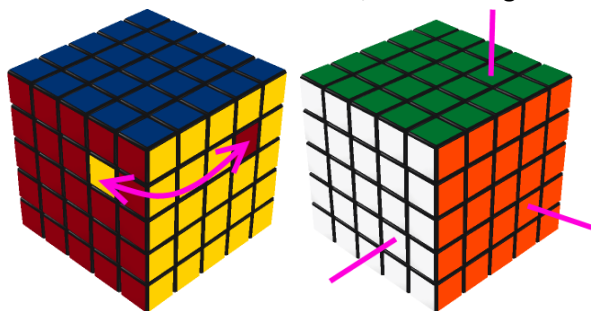
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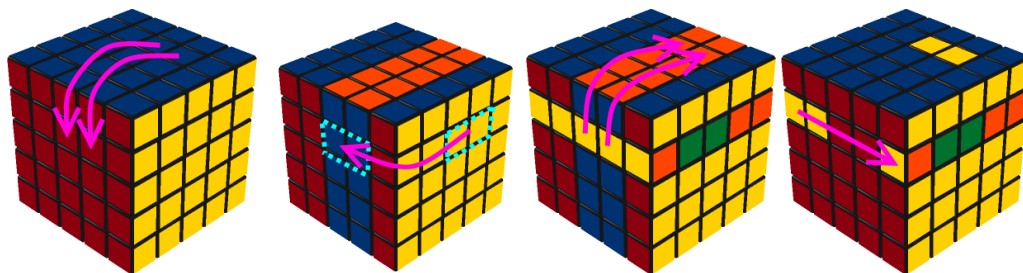
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As a result of this substitution, we exchanged only two central elements:

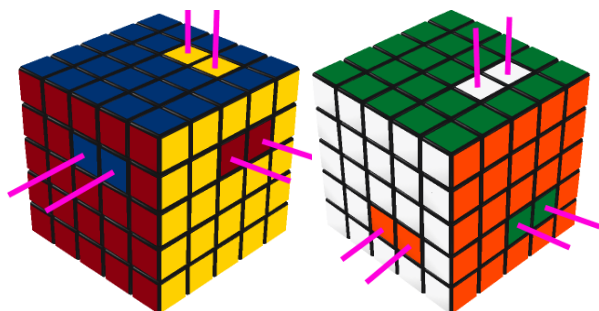


Using only this scheme with a different offset of coordinate axis, we can step by step put all the central elements.

We can move at once several axes:



In the result:



Now making a substitution, we can to exchange 2 central elements.

Another move for a quick exchange two pairs of central elements:

Rotate the first layer on 180°	Rotate the second layer on 180°	Return the first layer	Return the second layer	2 pairs of parallel central elements are exchanged

Note we can move several central elements if we rotate at once several layers.