

RUBIK'S CUBE:
HOW TO SOLVE
THE
SHEPHERD CUBE
AND THE
TARTAN CUBE

By
Paul N. Adams

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the
Shepherd Cube
and the
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About the Author

Paul is a Stress-Release Consultant, and has been working in this field for over 40 years. Stress Management is learning to live with it. Stress Release is getting rid of it. Permanently.

The Rubik's Cube is just a personal hobby and not part of any formal stress-release procedure.

Other websites include:

- www.paulsrobot.com,
- www.paulsrobot3.com,
- www.rubandyawn.com,
- www.yawnandgrowrich.com,
- www.yawnguy.com and
- www.yawnmachine.com.

Preface

In May 2002 while living in Los Angeles I purchased a Shepherd Cube and a Tartan Cube. I noticed that there was no solution online, so I worked out a simple one for each and put them on a web site.

In July 2009 I combined the two into a simple eBook and made it available via the Smashwords publishing platform at www.smashwords.com/books/view/2470.

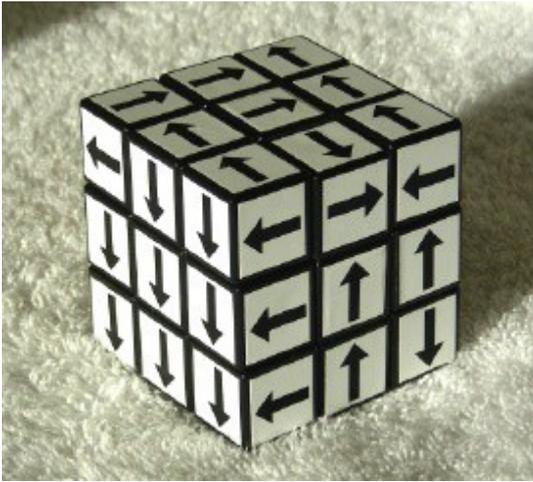
I am making a new version of this eBook available in celebration of the Spring 2016 launch of the OpenBazaar marketplace at www.openbazaar.org.

Note that there is a good write-up at www.jeays.net/rubiks.htm#sol2 of David Singmaster's notation, and the simple solution I refer to in the book text.

Paul Adams

Newcastle upon Tyne, UK
March 28, 2016

Chapter 1: Shepherd Cube



This is my description of how to solve a Shepherd's cube.

1. A generalized Shepherd's cube is based on a regular 3x3x3 Rubik's cube, except each of the fifty-four cubie faces differs only in orientation. When solved, each of the six cube faces has all nine of its cubie faces with the same orientation. The clearest design is a black arrow on a white field, with the arrow pointing up, down, left or right. A solved cube could be oriented so that just looking straight at it (without the viewpoint shifts associated with standard Singmaster notation) the top face points left, the left face towards you, the front face up, the right face away, the far face down and the bottom face right. Opposite faces point in opposite directions.

2. There are only four different types of edge piece, three of each type. Similar-looking edge pieces can be considered interchangeable, with the one exception described below. Read an edge piece as if it were in the top front position, looking at the top face and then the front face, for example, "left-up". This is equivalent to "down-right", which is how it would appear if you flipped the cube over either physically or mentally. There is no need to list out the different types of edge piece.

3. There are only four different types of corner piece. Similar-looking corner pieces can be considered interchangeable, with no exceptions. The four types are:

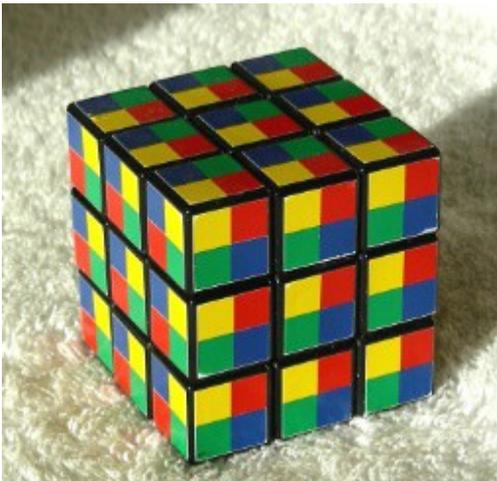
- A. One corner piece, when viewed in the top left front position, that has the top face left, the left face towards, the front face up. Any one of the three arrows will point to another face on the same cubie. If you twist this cubie either clockwise or counterclockwise, it will still look the same, so let's call it a "samie".
- B. One corner piece, found diametrically opposite on a solved cube, that when viewed in the top left front position has the top face towards, the left face up, the front face left. Any one of the three arrows will point to the same cubie. This is the other "samie".
- C. Three "matchable" corner pieces, each of which has or could have the up face aligned (either left/right or up/down) with the up center and edge pieces. It might sound complex but visually it's obvious--either the arrow blends in or it's at right angles and stands out as wrong. No further description of this kind of corner cubie is necessary.
- D. Three "unmatchable" corner pieces, each of which does not have or could not have the up face aligned (either left/right or up/down) with the up center and edge pieces.

4. I am basing this description on an elementary solution, that I believe is known as the Singmaster 2, i.e. make a cross on the up face; solve three corners correctly on the same up face; flip the cube over and solve three of the edge positions in the middle layer; solve three edge positions on the up layer; solve the two remaining edge positions; put the five remaining corner pieces into the correct positions; solve the orientations of those five corner pieces. But use this solution with the modifications as shown below. You can adapt these modifications to your own favorite way of solving a regular cube.

5. Start with the top face center cubie pointing left; rotate the left face so the center cubie points towards you; the front one up; the right one away; the back one down; the bottom one doesn't matter for now. The reason for always starting with the same orientation is so that if you put the cube down, or look away too long, it is easier to figure out where you are up to in the procedure.

6. Make a cross on the up face, starting with the "left-up" edge position, then "down-right", then "right-down", then "up-right". Then put in three corners correctly, starting with the first "samie". For each of the next two, first select a "matchable" corner cubie, and then make sure to align it correctly as you put it into position. Again, if you always solve the same positions in the same order it is easier to figure out where you are if you get lost.
7. Flip the cube over and solve the three edge positions in the middle layer, reading them the same way as before even though you are solving each in the front right position and not the front top position.
8. Orient the center cubie of the up face correctly, i.e. the opposite way to the down face.
9. Now for the remaining edge pieces. Solve the top front edge position, then the top left edge position, then the top back edge position, in that order. At this point comes that exception mentioned above, where similar-looking edge pieces are not necessarily interchangeable. There are two possibilities at this point: situation one, the two remaining edge pieces are already correct or just need to be flipped in place with the regular BU'B'UR'URU'; or situation two, they aren't. With situation two, you need to interchange one of the remaining edge pieces with one or the other of its similar-looking fellows. One swap will work, i.e. transform into situation one, the other won't. So if the first swap doesn't work, the second swap will.
10. Now all the edge pieces are in place and there are at most five corners left to do, with the down right back position being (usually) unsolved. Locate the (usually) unsolved "samie" cubie and put it in the correct position, taking care not to move it afterwards. Rotate the up face so a mismatched cubie is in the up left front position, and put it into a position where it matches. Repeat until all five corner cubies are in correct positions.
11. Do the usual clockwise/counterclockwise twists to solve the corners. There is only one difference you will frequently run into--everything appears solved except for one corner, which needs to be twisted clockwise or counterclockwise. Use a "samie" as the other cubie of the pair and twist as normal.

Chapter 2: Tartan Cube



This is my description of how to solve a Tartan cube.

1. A Tartan cube, as invented by Dan Hoey, is a regular 3x3x3 Rubik's cube, except that each of the fifty-four cubie faces is divided into quarters, with one of the colors red, green, yellow, blue in each corner. Each of the six faces has these four colors in different positions, with each cubie face on one cube face looking the same. When solved, the cube could be oriented so that each cubie in the top face reads green, yellow, red, blue when reading top left, top right, bottom left, bottom right respectively. The other faces are oriented as in step 7.

2. Always begin and continue the same way so that when taking breaks or getting lost it is easy to orient the cube correctly to see where you are up to.

3. ALWAYS read colors in the same sequence, i.e. top left, top right, bottom left, bottom right. ALWAYS read an edge piece ending with the common edge, like GYRB or GYBR (same piece). ALWAYS read a corner piece ending up with the common corner, like GYRB or YRGB or RGYB (same piece). It doesn't matter which way you are looking at it. For example, if you put a solved cube on the table and look at the up face without moving your head and the center cubie is, say, GYRB, the back up left corner cubie is BRYG; the back up right corner cubie is RBYG, the left up edge cubie is YBGR and so on. This takes a little bit of getting used to, but it is THE key point in solving this cube rapidly.

4. Edge pieces. In looking for an edge piece, first note EDGE colors, where the colors extend over the edge from one face to the adjacent face. There are two edge pieces with the same edge colors, for example GYRB/GYBR and YGRB/YGBR. Here both edge pieces have red and blue as edge colors. Note that if ONE face matches then it is the correct edge piece. If it is in the correct position then it must also be in the correct orientation. Take the first possible edge piece with the correct edge color pair (any order) and notice the top pair. If they match the piece you are searching for, then either the face you are looking at is correct or the other face is. You don't need to check the other face as it HAS to be correct--you only need to check one face once you have determined it is the correct piece. If you have a piece with the correct edge color pair (any order) and the top pair does not match, drop it, wrong piece. Don't bother to check the other face. . Example: you are looking for the edge piece to match GYRB. You find one of the two blue/red edges. The top pair is YG so this is the WRONG piece. You want the other one. You don't need to check the second face of the wrong edge piece. It is very quick to scan over the cube noting edge colors only and ignoring the rest.

5. Corner pieces. First see what the corner color, extending over three faces, is. There are two corner pieces with the color you want. Example: GYRB/YRGB/RGYB and YGRB/RYGB/GRYB. Note that if ONE face matches and the corner piece is in the correct position, then it is the correct corner cubie in the correct orientation. It is very quick to scan over the cube noting extreme corner colors only and ignoring the rest.

6. The start position is up face center cubie = GYRB.

7. Orient the front face so that TOP pair of the center cubie = RB, i.e. the BOTTOM pair of the up face. Rotate the whole cube as needed to find the face that allows RB as the top pair of the center cubie (there is only one face that allows this). Going counterclockwise, rotate the remaining three adjacent faces so the top pair of the center cubie face matches the bottom pair of the up face, i.e.

GR, YG, BY.

8. Here I am using the elementary Singmaster 2 solution, i.e. make a cross on the up face; solve three corners correctly on the same up face; flip the cube over and solve three of the edge pieces in the middle layer; solve three edge pieces in the up layer; solve the two remaining edge pieces; put the five remaining corner pieces in correct positions; solve orientations of those five corner pieces. You can adapt the procedure to your own preferred methods.

9. Before starting the step of solving the front, left and back edge pieces, orient the up face correctly. Then solve the up front edge position, then the up left edge position, then the up back edge position. At this point, either the two remaining edge pieces will have been solved automatically, or they are simply inverted and can be flipped using BU'B'UR'URU'. There are no other possibilities.

10. Put the five remaining corner pieces in place by noting corner colors only and ignoring the rest. This is very quick and very simple. Then fix orientations as needed.

11. Note that with a corner piece in the correct position, if one face of that cubie is correct then all of them are or if one face is wrong then all of them are.