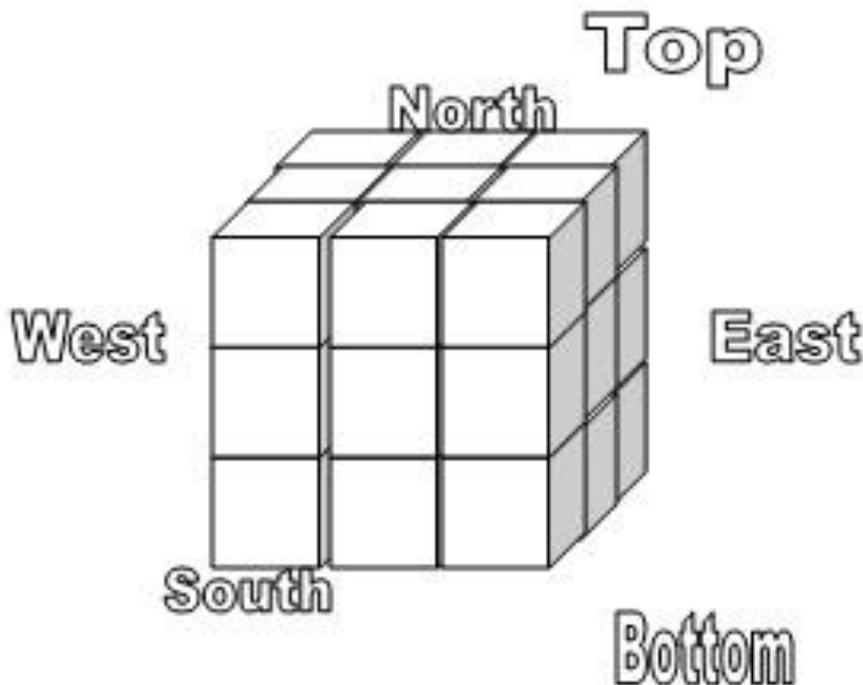


# Solving the Cube



## Solving the Cube

- 1) Let's refer to each of the faces by the points of the compass and Top and Bottom.
- 2) The moves will be clockwise  $\cup$  or anticlockwise  $\cap$  for each face. Therefore, if you were holding the cube as shown above and saw the instruction **S $\cup$**  you would know to turn the south face (i.e. the one facing you) one turn clockwise. If you saw the instruction **B $\cap$** , then you would have to turn the Bottom face one turn anticlockwise and so on. An instruction **E $\cup\cup$**  would mean turn the East face two turns clockwise.

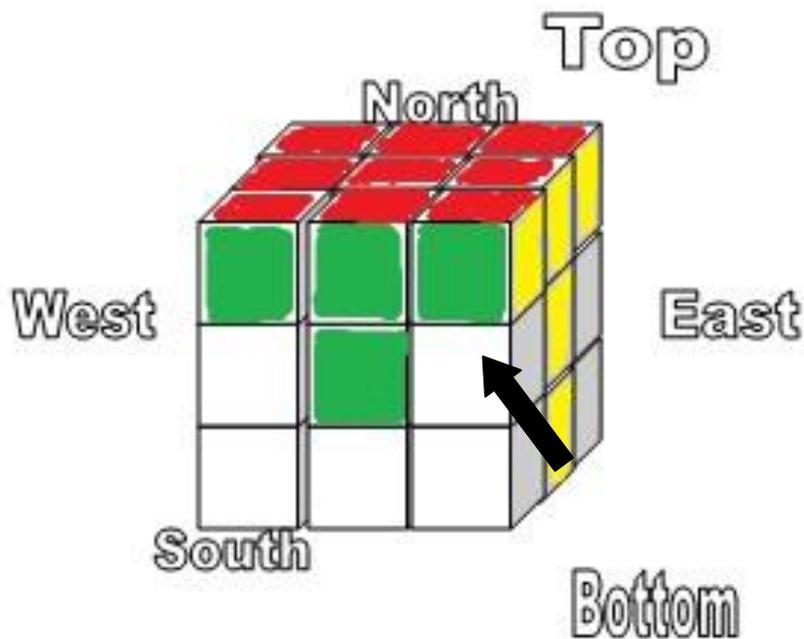
## Stage 1: The Top Face

The first decision to make is where to start. Choose a colour to do first. Look at the middle cube as this is the one that doesn't change. The mechanism of the cube is based around these middle cubes and the other cubes lock into them.

There is no formula for sorting the top or first face of the cube. It is a question of practising so you are moving cubes to form this first face. This is a good way of getting a feel for how the cube works. It's useful to do before you start using the formulas for the other faces.

## Stage 2: The Top Row

Once you have completed one whole face, you now need to look at the top row. Again, it is a question of practice to move the cubes around into the correct place. After a while you will be able to do the first and second stages at the same time as you become more proficient.

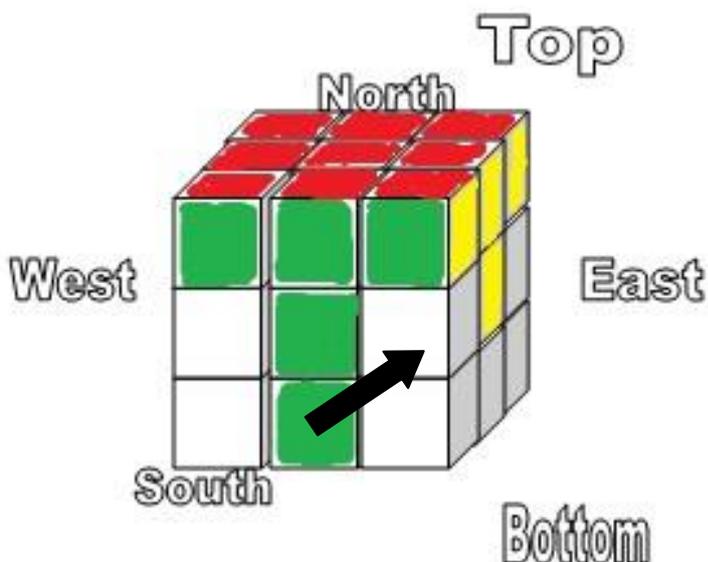


**Stage 3a: The Middle Row (right to left)**

You now need to complete the middle row by moving a cube from the bottom row into position as show on the diagram above.

To move this cube into the middle position (NB the bottom of this cube is coloured green so it is the correct cube for this position)

$B\cup, S\cup, B\cup, S\cup, E\cup, S\cup, E\cup, S\cup$

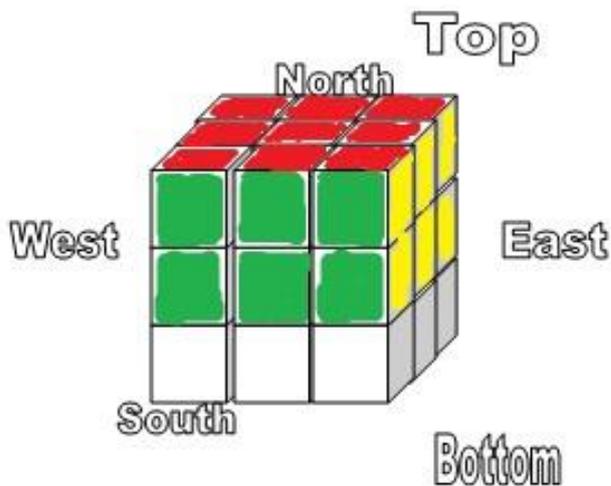


**Stage 3b: The Middle Row (left to right)**

Sometimes the cube will be on the other side so you have to move it from left to right.

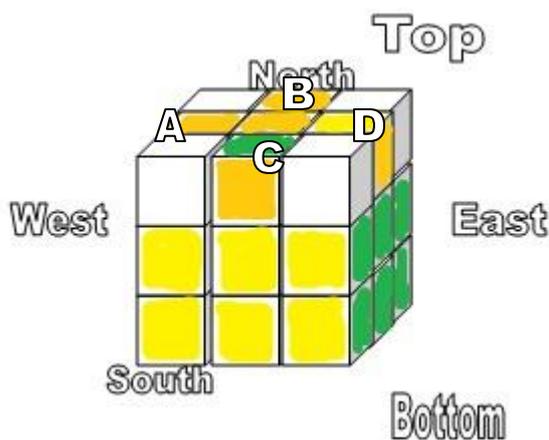
To move this cube into the middle position (NB the bottom of this cube is coloured yellow)

$B\cup, E\cup, B\cup, E\cup, S\cup, E\cup, S\cup, E\cup$



**Stage 3c: The Middle Row Completed**

When you have gone around the whole cube and completed the entire middle row, the cube will look like the diagram above. You now need to work on the bottom of the cube. Flip the cube upside down and we will refer to the Bottom face of the cube as the new Top face of the cube.

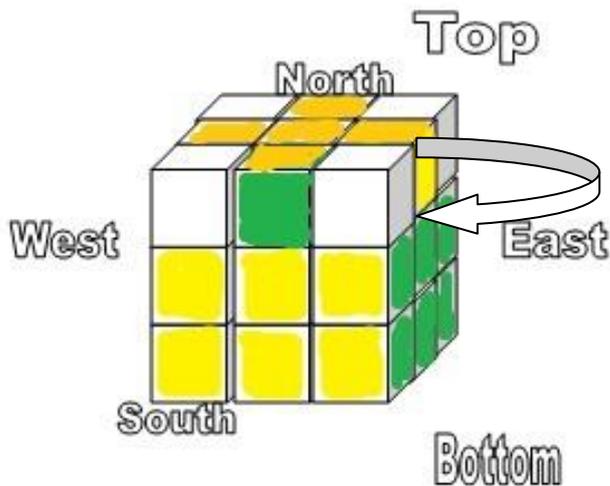


**Stage 4: The Cross**

Now you've flipped the cube upside down, your next goal is to get the colours on the new top face to form a central cross. In this scenario, the colour for this face is orange. As you can see on the diagram above, the middle cube is orange and two of the other cubes have orange showing on this new top face. I've labelled these A and B. The cubes marked C and D do not have their orange faces on the top so need flipping. The following formula is the longest one you will have to do and will certainly need practice!

**S<sup>U</sup>, T<sup>U</sup>, B<sup>U</sup>, W<sup>U</sup>U , T<sup>U</sup>U, B<sup>U</sup>U, E<sup>U</sup>, T<sup>U</sup>, E<sup>U</sup>,  
T<sup>U</sup>U, B<sup>U</sup>U, W<sup>U</sup>U, T<sup>U</sup>, B<sup>U</sup>, E<sup>U</sup>**

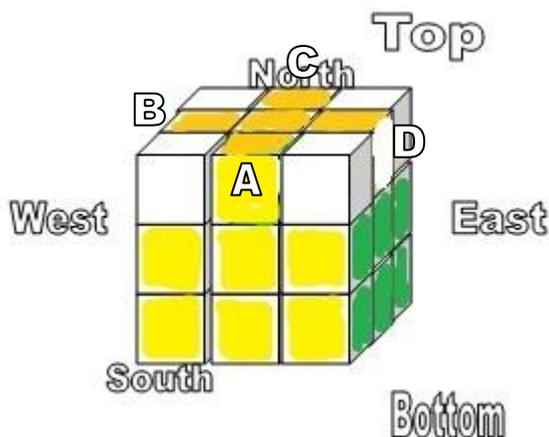
Stage 4 allows you to flip two adjacent cubes at the same time. You may need to repeat this process until you've completed all of the cross. Sometimes, the cross may be in place when you have flipped the cube upside down, other times, you may have none of the cross apart from the middle cube. On other occasions you may have two cubes flipped up but forming a line across the middle. You will have to use stage 4 to undo this.



**Stage 5: The New Top Row Aligned with the Cross**

Once you have completed stage 4 and have the cross completed on the new top face, you will concentrate on the middle/edge cubes that form the cross. You may find that the colours on these cubes do not align with the colours on the North, East, South and West faces.

First, you need to align one of these middle/edge cubes with the correct colours on a face. So, if we look at the diagram above, I would turn the top face clockwise (as shown by the arrow) so the yellow is aligned with the yellow face. The cube will now look like the one below.

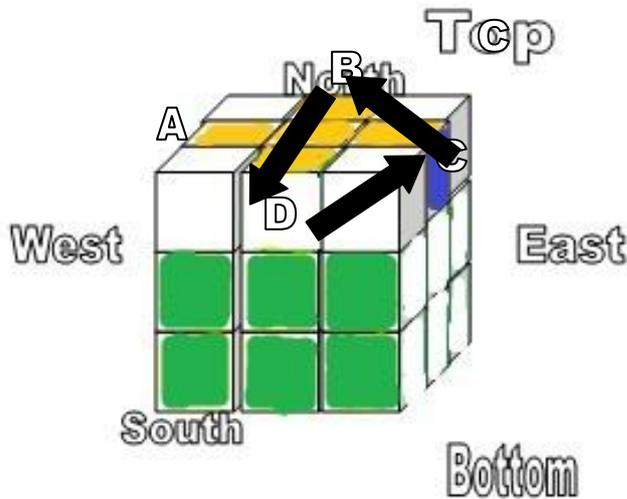


I've labelled these cubes to explain what they are:

- A) Having turned the top face clockwise this yellow cube is now aligned with the predominantly yellow South face.
- B) The colour on this face, which is hidden from our view is green so this needs to end up where cube D is;
- C) This cube is blue and needs to end up where cube B presently is (the West face is predominantly blue)
- D) As we can see, this cube is white, which needs to end up on the North face.

I'm now going to turn the whole cube around once so the yellow face with cube A on it will become the West face. The formula I'm going to use will then move cube D to where cube

C is; and cube C to where cube B is and cube B to where cube D is. These three cubes will be moving in an anti-clockwise direction while A doesn't move at all.



$E\cup\cup, T\cup, N\cup, S\cup, E\cup\cup, S\cup, N\cup, T\cup, E\cup\cup$

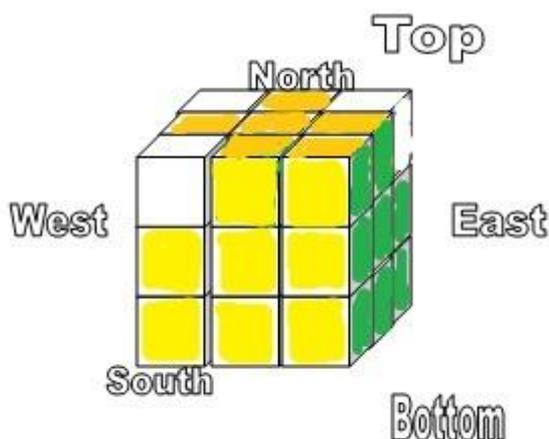
Before you undertake this stage, you may need to turn the top face a few times until you have the cubes arranged so they will move in this direction. If you cannot see any way to align them so they will move in this anticlockwise direction, then still do use the formula above, then find a good position and repeat the formula again.

**Stage 6: Positioning the corner cubes**

Once you have completed stage 5 and you have the cross completely finished you just have the corner cubes to finish. Not long to go now!

Look at the cube below. Luckily, one of the corner cubes is in the correct position. Not only is this one in the correct position but all the colours are aligned correctly. If the colours were not aligned at this stage, do not worry. The final stage will rectify this. At this stage, we just need to make sure it is in the correct position i.e. it is a corner cube with yellow, orange and green faces so this is the one we need here.

The other three cubes are not in the correct position but need moving



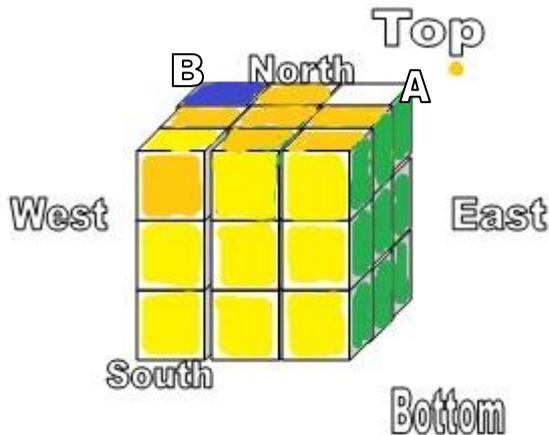
Use the following formula.

$W\cup, T\cup, E\cup, T\cup, W\cup, T\cup, E\cup, T\cup$

If the corner cubes are not in their correct position then repeat this formula once more and they will be in the correct position.

**Stage 7: Flipping the corner cubes**

Once you have completed stage 6 you will have all four corner cubes in their correct position although the colours may not be aligned.



We are going to flip one corner cube at a time. Holding the cube in the position shown in the above diagram, we are aiming to flip corner cube A so that it will be correct way up.

Use the following formula:

$E\cup, B\cup, E\cup, B\cup,$

You may have to use this several times before cube A is flipped. At this point, you may be worried because the rest of the cube seems to be mixed up. Don't panic! This is normal! While holding the cube in this same position, now rotate the top face so that another corner cube that needs flipping is in position A. For instance, we can see that corner cube B will be the next one we need to flip. Therefore, when corner cube A is correct, turn the top face clockwise once and repeat the formula

$E\cup, B\cup, E\cup, B\cup$  until it is correctly aligned.

Keep turning the top face and then undertaking this formula until all of the corner cubes are flipped the right way up. Once you complete the last of these four corner cubes, you will find that the cube is completed.

Voila!