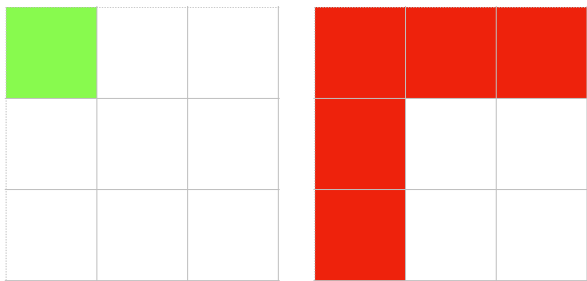


Observations:

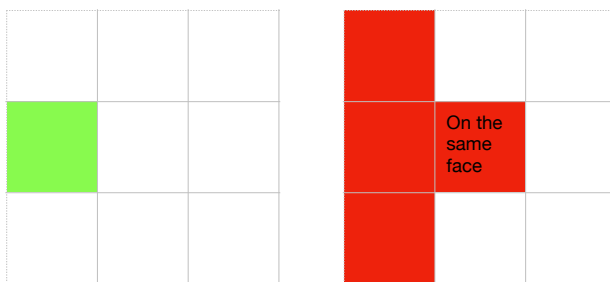
- To complete the cube, I allocated the colours 'groups'.
 - Groups had the same 3 colours each:
 - Yellow, purple, light green
 - Orange, dark green, brown
 - Pink, blue, red
- I arranged the groups into rows - each group had a different row. This completed the top face.
 - I then rearranged the last group in the top layer to the middle. I arranged the pink, blue and red in the same row as each other.
 - However, the order of the colours and the row they were in had changed. I put the colour at the front of the group (pink), to the end - order: blue, red, pink.
 - I repeated this for the last layer, putting blue to the end of the row (red, pink, blue) and changing the row to the only one which had not been used.
- When completing this, I noticed:
 - If a colour is in the corner of any layer, the same colour cannot be in another corner or the same/row or column. For example:



Green = colour chosen
 Red = on other layers, green cannot be in these places

Using the green in the picture, we can see it is not possible to put another green in the same row/column (marked with ~~red~~) - it is already present. This is because corners on the top and bottom layer are present on 3 faces. The middle corner is no exception, even if it only covers two faces. This is shown by the green, demonstrated by the blue cube.

- If a colour is in the middle of a side of a layer (green) or in the corner they cannot be in the following places:

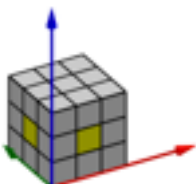


For example, the orange cube covers two faces and another orange cannot be put in the spaces marked _____

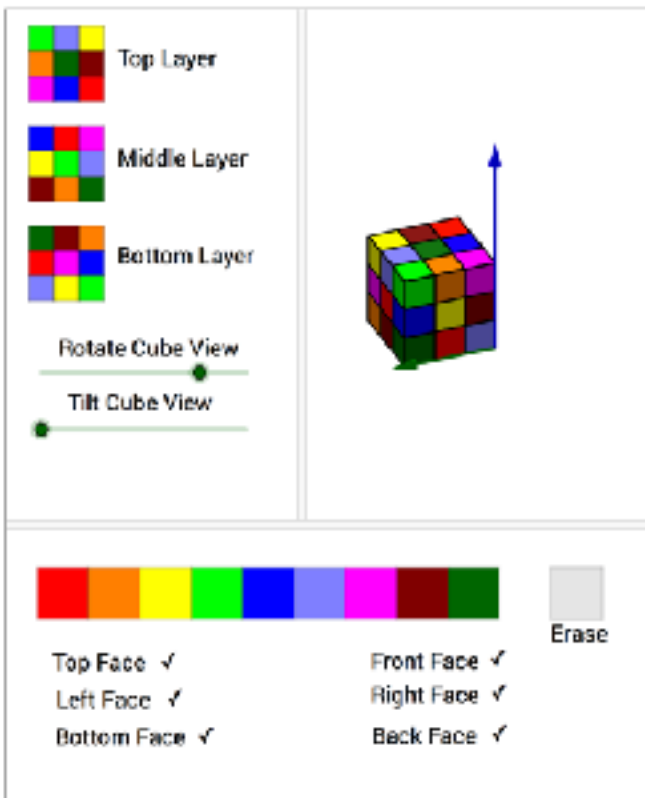
This also applies to colours on the middle layer in this position.

Even though arranging the same colour twice on one layer is possible (the centre colour in the middle is not seen), this arrangement is not possible:

As it takes up the position of another colour (see the corner rule above).



From these rules, and using the groups I had created, I arranged the colours successfully:



The colours are arranged in groups, with each group being in the same row. However, rows change depending on the layer (e.g. pink, red and blue are in the bottom row of the top layer, but top row of the middle layer).

The order of colours in each group also changed each time. E.g.

Top layer, middle row: orange, dark green, brown
 Bottom layer, top row: green, brown, orange
 Middle layer, bottom row: orange, green, brown.

The first colour is moved to the back each time to give a different arrangement.