

# Serbian Calendar Cube Design

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## Introduction

The Magic Cube was invented in 1974 by Hungarian-born **Ernő Rubik** and was later called the **Rubik's Cube**. An English calendar cube was subsequently invented and calendar cubes have been designed in many other languages since then. A **Serbian Calendar Cube** is a 3x3x3 **Rubik's Cube** used as a **Serbian Calendar**. There are **Virtual Cubes** that can be *virtually* rotated and twisted on a computer screen and **Real Cubes** that can only be *physically* rotated and twisted by hand. A **Texture** is laid down on a Virtual Cube whereas real **Stickers** are stuck down on a Real Cube. A Serbian Calendar Cube is designed by placing letters, numerals and words on a texture which is then laid down on a Virtual Cube (see <http://www.randelshofer.ch/>).

Serbian Language – Useful Links
<a href="http://en.wikipedia.org/wiki/Serbian_language">http://en.wikipedia.org/wiki/Serbian_language</a>
<a href="http://moon-aka-sun.livejournal.com/205107.html?thread=573235">http://moon-aka-sun.livejournal.com/205107.html?thread=573235</a>
<a href="http://www.mementoslangues.fr/Serbe/Grammaire/GrammaireSerbe.pdf">http://www.mementoslangues.fr/Serbe/Grammaire/GrammaireSerbe.pdf</a>

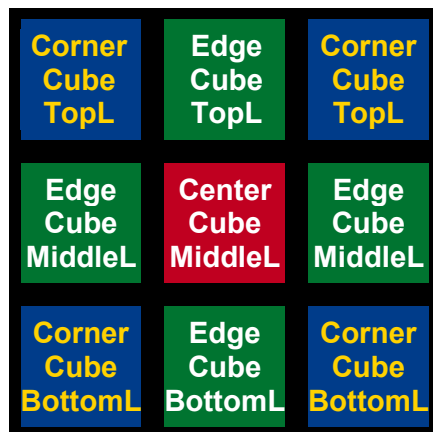
**Serbian** (српски језик; *srpski jezik*) is a South Slavic language, spoken chiefly in Serbia, Bosnia and Herzegovina, Montenegro, Serbs in Croatia, and in the Serbian diaspora. Standard Serbian is based on Shtokavian dialect, like Croatian and Bosnian, with which it is mutually intelligible, and was previously unified with under the standard known as Serbo-Croatian. It counts among official (and minority) languages of Serbia, Bosnia and Herzegovina, Montenegro, Croatia, Romania, Republic of Macedonia and Hungary.

The date of the day can be displayed on a *selected* Cube Face by rotating and twisting some parts of the Cube. When this has been achieved, we say that the Cube has been *solved*. The following example shows the *initial* state of the Cube (Monday, January 01).

Virtual Serbian Calendar Cube	
<p>Serbian Calendar Cube Texture</p>	<p>Virtual Serbian Calendar Cube</p>

## Terminology

In a 3x3x3 **Rubik's Cube**, there are 8 *Corner Cubes*, 12 *Edge Cubes*, 6 *Center Cubes* and 6 *Cube Faces*. There are also 4 *Corner Cube faces*, 4 *Edge Cube faces* and 1 *Center Cube face per Cube Face*, as shown below.



There are 1 face per Center Cube, 2 faces per Edge Cube and 3 faces per Corner Cube.

There are also 3 horizontal *Layers* called *Top*, *Middle* and *Bottom Layers*.

Cube Lexicon		
English	Français	Deutsch
Cube	Cube	Würfel
cube, cube	cube, petit cube	Würfeteil, Teil des Würfels
face	face	Seite, Seitenfläche
front face	face avant	vordere Seite, vorne
back face	face arrière	hintere Seite, hinten
left face	face gauche	linke Seite, links
right face	face droite	rechte Seite, rechts
top face	face supérieure	obere Seite, oben
bottom face	face inférieure	untere Seite, unten
sticker	étiquette (autocollante), plaquette	Kleber, Farbkleber
tile	tuile, plaquette	Plättchen, Farbplättchen
center cube, center	cube central, centre	Mittelwürfel, Mittelstein, Mitte
edge cube, edge	cube-arête, arête	Kantenwürfel, Kantenstein, Kante
corner cube, corner	cube de coin, coin	Eckwürfel, Eckstein, Ecke
layer	couronne	Schicht, Scheibe
top layer	couronne supérieure	obere Schicht, obere Scheibe
middle layer	couronne intermédiaire	mittlere Schicht, mittlere Scheibe, Mittelschicht, Mittelscheibe
bottom layer	couronne inférieure	untere Schicht, untere Scheibe
orientation, direction	orientation	Orientierung
to solve	résoudre	lösen, zusammen drehen
to twist	pivoter	drehen
to rotate	tourner, effectuer une rotation	drehen
clockwise	dans le sens horaire	im Uhrzeigersinn
anticlockwise, counter-clockwise	dans le sens anti-horaire	im Gegenuhrzeigersinn

# Serbian Calendar Cube Design

## Serbian Calendar

Serbian Calendar				
Months			Weekdays	
English	Serbian		English	Serbian
January	<u>ЈАН</u> уар	Јануар	Monday	Понедељак
February	<u>ФЕБ</u> руар	Фебруар	Tuesday	Уторак
March	<u>МАР</u> т	Март	Wednesday	Среда
April	<u>АПР</u> ил	Април	Thursday	Четвртак
May	<u>МАЈ</u>	Мај	Friday	Петак
June	<u>ЈУН</u> (и)	Јун(и)	Saturday	Субота
July	<u>ЈУЛ</u> (и)	Јул(и)	Sunday	Недеља
August	<u>АВГ</u> уст	Август		
September	<u>СЕП</u> тембар	Септембар		
October	<u>ОКТО</u> бар	Октобар		
November	<u>НОВЕ</u> мбар	Новембар		
December	<u>ДЕЦЕ</u> мбар	Децембар		
8 letters on <b>Bottom Left</b> corner cubes			Ј Ф М А С О Н Д	
7 letters on <b>Bottom Center</b> cubes			А Е П У В К О	
10 letters on <b>Bottom Right</b> corner cubes			Н Б Р Ј Л Г П Т В Ц	

## Cube Layout

In this design, weekdays are displayed on **Top Layer**, days of the month on **Middle Layer** and months on **Bottom Layer**.

## Top Layer Layout

Top Layer: Weekdays								
Среда (Wednesday)			Петак (Friday)			Субота (Saturday)		
	Среда			Петак		Субота		

Weekdays on the **Top Layer** are sorted out as follows:

- 1- 2 **Top Left** weekdays and 1 blank on 1 corner cube: Субота, Недеља, blank\_ **TL/TR**
- 2- 5 **Top Center** weekdays and 1 blank on 3 edge cubes: Понедељак, Уторак, Среда, Четвртак, Петак, blank\_ **TC**
- 3- 3 blanks on 1 corner cube

Weekdays are now *logically* combined on corner cubes:

- 1- 1 **Top Left** corner cube: (Субота, Недеља, blank\_ **TL/TR**)
- 2- 3 **Top Center** edge cubes: (Понедељак, Уторак), (Среда, Четвртак), (Петак, blank\_ **TC**)
- 3- 1 **Top Right** corner cube with blanks

So, now there are 6 corner and 9 edge cubes left that can be used for the 2 remaining layers.

## Middle Layer Layout



Numbers on the **Middle Layer** are sorted out as follows:

- 1- 4 **Middle Left** numbers and 1 blank on edge cubes: 0, 1, 2, 3, blank\_ **ML/MR**
- 2- 7 **Middle Center** numbers on center cubes: 0, 1, 2, 3, 4, 6/9
- 3- 3 **Middle Right** numbers and 1 blank on edge cubes: 5, 7, 8, blank\_ **ML/MR**

Letters are now *logically* combined on edge cubes:

- 1- 3 **Middle Left** edge cubes: (0,1), (2,blank\_ **ML/MR**), (3,blank\_ **ML/MR**)
- 2- 2 **Middle Right** edge cubes: (5,7), (8,blank\_ **ML/MR**)

So, now there are 6 corner and 4 edge cubes left that can be used for the Bottom Layer.

## Bottom Layer Layout



Letters on the **Bottom Layer** are sorted out as follows:

- 1- 8 **Bottom Left** letters on corner cubes: J, Ф, М, А, С, О, Н, Д
- 2- 7 **Bottom Center** letters on edge cubes: А, Е, П, У, В, К, О
- 3- 10 **Bottom Right** letters on corner cubes: Н, Б, Р, J, Л, Г, П, Т, В, Ц

Letters are now *logically* combined on corner and edge cubes:

- 1- 3 **Bottom Left** corner cubes: (J,Ф,М), (А,С,О), (Н,Д,Т\_ **BR**)
- 2- 4 **Bottom Center** edge cubes: (А,Е), (П,У), (В,К), (О,blank\_ **BC**)
- 3- 3 **Bottom Right** corner cubes: (Н,Б,Р), (J,Л,Г), (П,В,Ц)

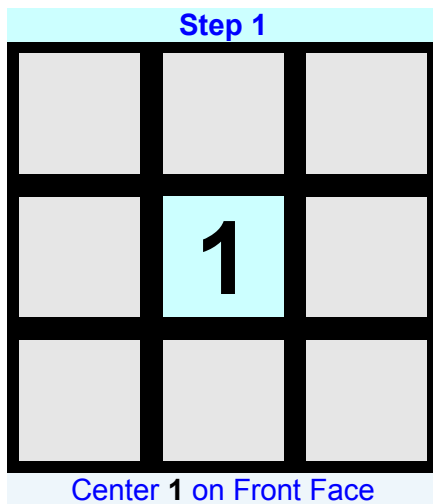
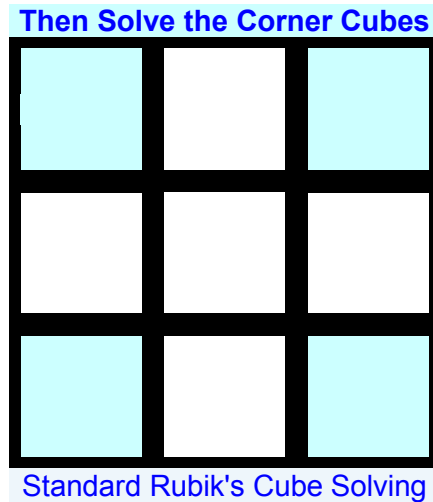
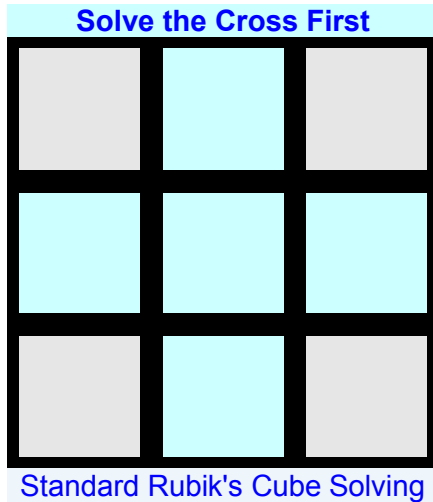
## Serbian Calendar Cube – Layout Table

### Reading from Left to Right

Top <b>L</b> eft – Corner cubes	Top <b>C</b> enter – Edge cube	Top <b>R</b> ight – Corner cube
Субота, Недеља, blank	Понедељак, Уторак, Среда, Четвртак, Петак, blank	blank
Middle <b>L</b> eft – Edge cubes	Middle <b>C</b> enter – Center cubes	Middle <b>R</b> ight – Edge cubes
0, 1, 2, 3, blank	0, 1, 2, 3, 4, 6/9	5, 7, 8, blank
Bottom <b>L</b> eft – Corner cubes	Bottom <b>C</b> enter – Edge cubes	Bottom <b>R</b> ight – Corner cubes
J, Ф, М, А, С, О, Н, Д	А, Е, П, У, В, К, О, blank	Н, Б, Р, Ј, Л, Г, П, Т, В, Ц

# Solving a Serbian Calendar Cube Step by Step

In this example, a step by step solving process is applied to the Serbian Calendar Cube, just described before. Note that we only need to solve a *single* Face out of six. We will solve a Face for Monday, January 01.



**Step 5**

	Поне- дељак	
0	1	
	A	

Middle Layer: Edge Cube 0

**Step 6**

	Поне- дељак	
0	1	
	A	

Top Layer: Corner Cube Blank

**Step 7**

	Поне- дељак	
0	1	
	A	

Top Layer: Corner Cube Blank

**Step 8**

	Поне- дељак	
0	1	
	A	H

Bottom Layer: Corner Cube H

**Step 9**

	Поне- дељак	
0	1	
J	A	H

Bottom Layer: Corner Cube J

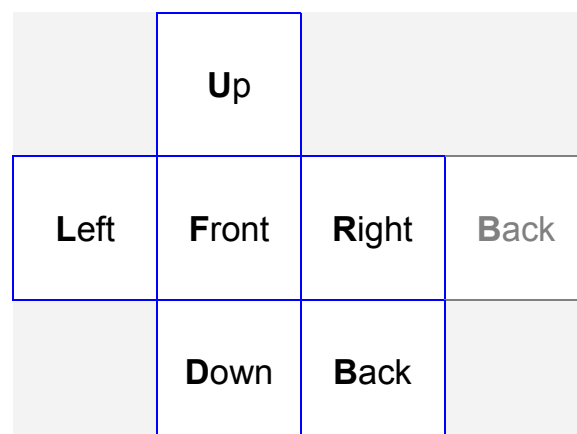
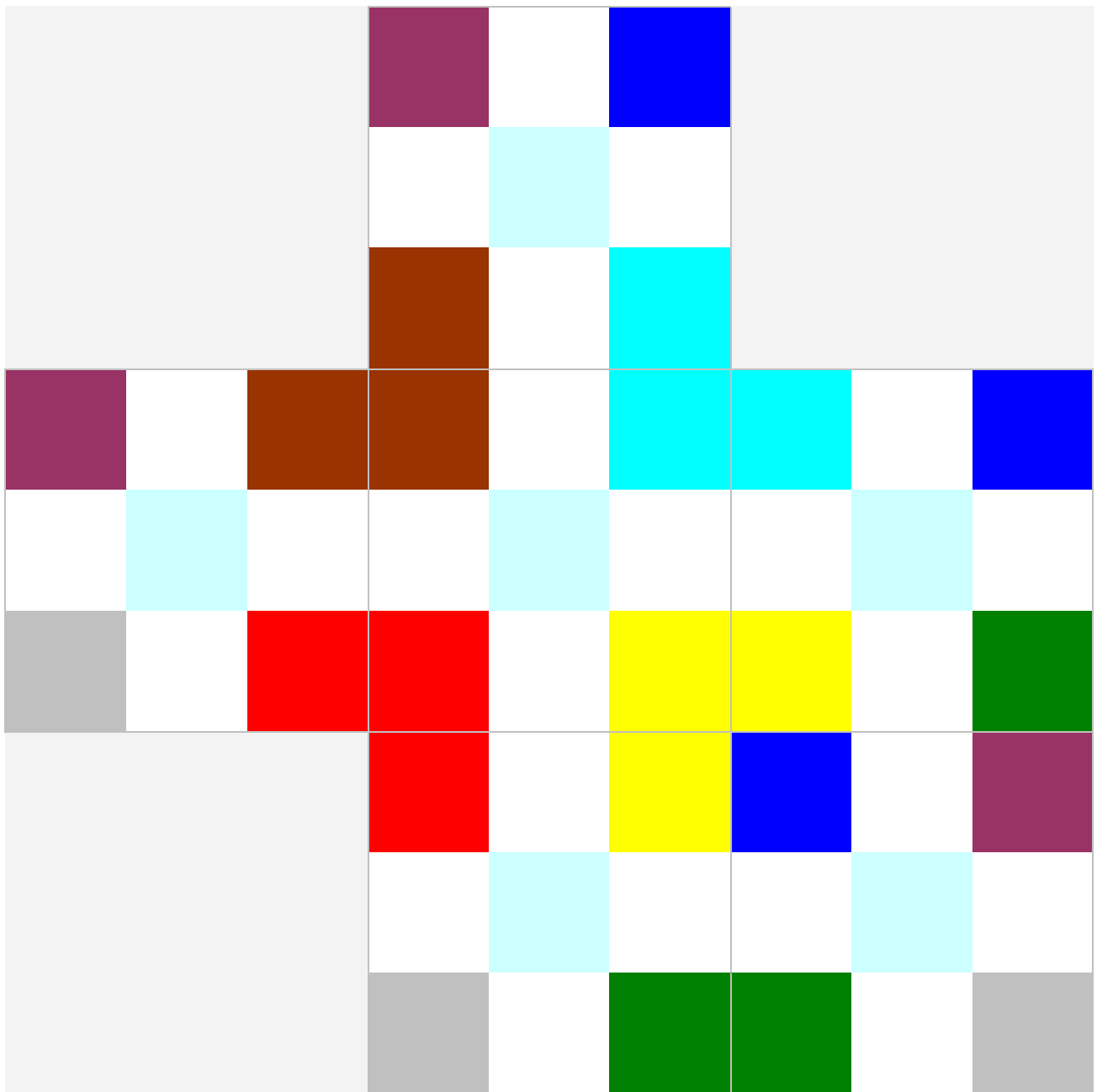
**Step 10**

	Поне- дељак	
0	1	
J	A	H

That's it !

## Corner Cubes Final Check

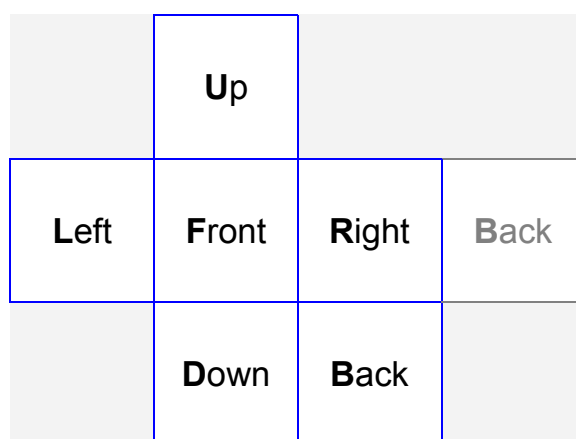
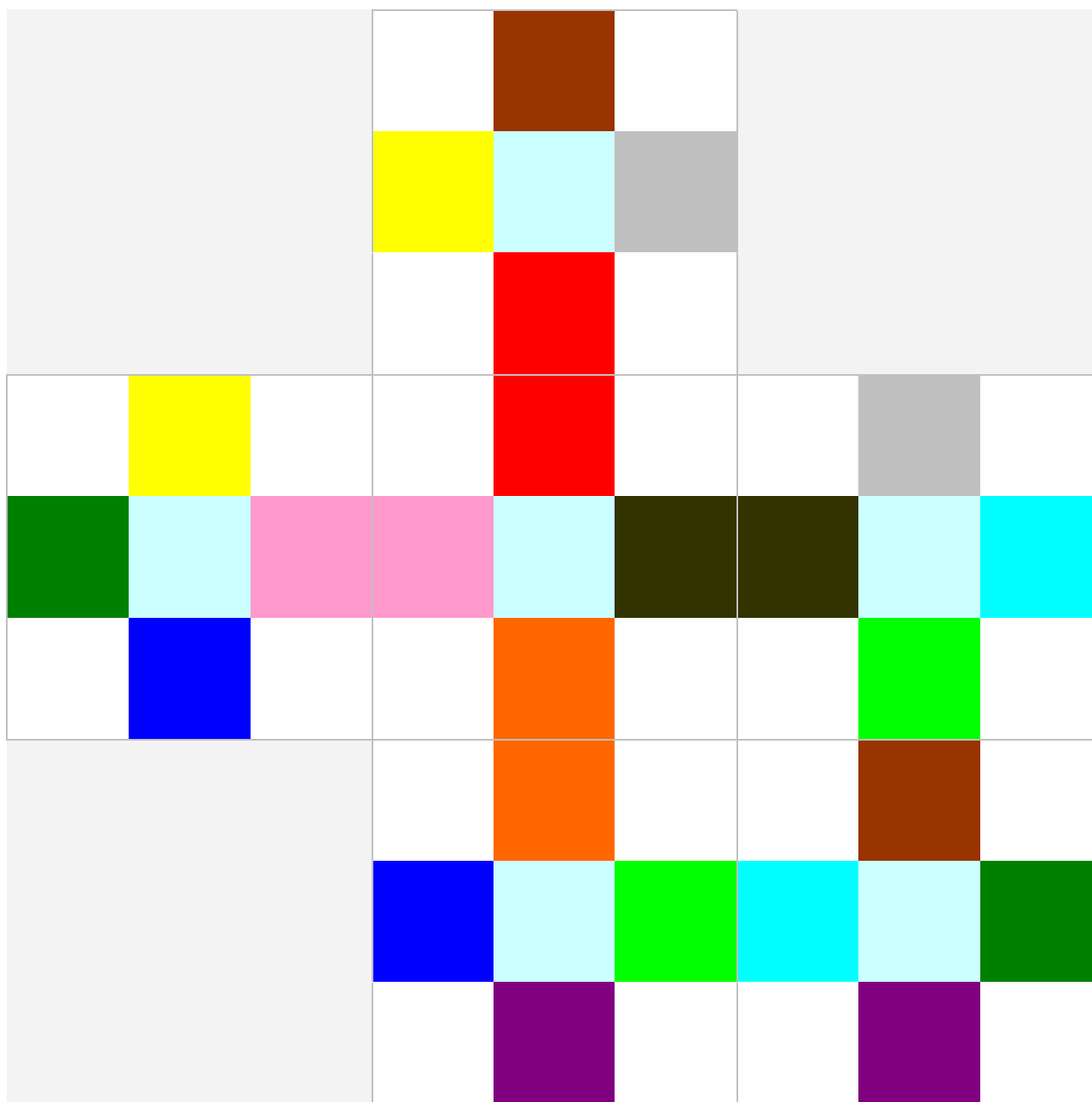
There are 8 Corner Cubes and 3 faces per Corner Cube. In the diagram below, each Corner Cube is displayed in 8 different colors and with the same color applied to each of its 3 faces. This diagram can be used as a convenient *visual aid* to check Design Rules (DRC).





## Edge Cubes Final Check

There are 12 Edge Cubes and 2 faces per Edge Cube. In the diagram below, each Edge Cube is displayed in 12 different colors and with the same color applied to each of its 2 faces. This diagram can be used as a convenient *visual aid* to check Design Rules (DRC).



## Texture Template

This is a texture template that can be printed out and used for writing down numbers and letters by hand *prior to* texture design. All is needed are pencil, rubber...and time.

