

# Croatian 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 **Croatian Calendar Cube** is a 3x3x3 **Rubik's Cube** used as a **Croatian 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 Croatian 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/>).

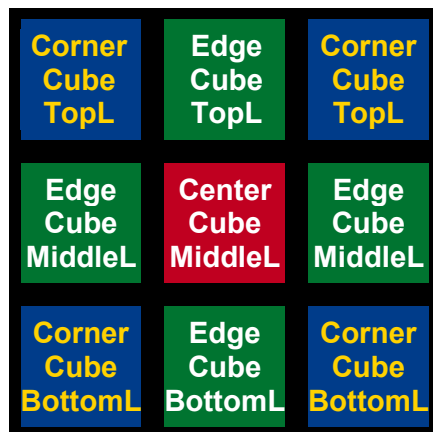
Croatian Language – Useful Links
<a href="http://en.wikipedia.org/wiki/Croatian_language">http://en.wikipedia.org/wiki/Croatian_language</a>
<a href="http://learn-croatian.com/abeceda.php">http://learn-croatian.com/abeceda.php</a>
<a href="http://www.mementoslangues.fr/Croate/Grammaire/GrammaireCroate.pdf">http://www.mementoslangues.fr/Croate/Grammaire/GrammaireCroate.pdf</a>
<b>Croatian language</b> ( <i>hrvatski jezik</i> ) is a South Slavic language which is used primarily in Croatia, by Croats in Bosnia and Herzegovina, in neighboring countries where Croats are autochthonous communities, and parts of the Croatian diaspora. It is sometimes classified as belonging to the Central South Slavic diasystem (also referred to as "Serbo-Croatian").

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 Croatian Calendar Cube	
Croatian Calendar Cube Texture	Virtual Croatian Calendar Cube

## 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

# Croatian Calendar Cube Design

## Croatian Calendar

Croatian Calendar				
Months			Weekdays	
English	Croatian		English	Croatian
January	<u>SI</u> Ječanj	Siječanj	Monday	Ponedjeljak
February	<u>VEL</u> jača	Veljača	Tuesday	Utorak
March	<u>OŽU</u> jak	Ožujak	Wednesday	Srijeda
April	<u>TRA</u> vanj	Travanj	Thursday	Četvrtak
May	<u>SVI</u> banj	Svibanj	Friday	Petak
June	<u>LIP</u> anj	Lipanj	Saturday	Subota
July	<u>SRP</u> anj	Srpanj	Sunday	Nedjelja
August	<u>KOL</u> ovoz	Kolovoz		
September	<u>RUJ</u> an	Rujan		
October	<u>LIS</u> topad	Listopad		
November	<u>STU</u> deni	Studen		
December	<u>PRO</u> sinac	Prosinac		
8 letters on <b>Bottom Left</b> corner cubes			S V O T L K R P	
8 letters on <b>Bottom Center</b> cubes			I E Ž R V O U T	
8 letters on <b>Bottom Right</b> corner cubes			J L U A I P S O	

## 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



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

- 1- 2 **T**op **L**eft weekdays and 1 blank on 1 corner cube: Subota, Nedjelja, blank\_ **TL/TR**
- 2- 5 **T**op **C**enter weekdays and 1 blank on 3 edge cubes: Ponedjeljak, Utorak, Srijeda, Četvrtak, Petak, blank\_ **TC**
- 3- 3 blanks on 1 corner cube

Weekdays are now *logically* combined on corner cubes:

- 1- 1 **T**op **L**eft corner cube: (Subota, Nedjelja, blank\_ **TL/TR**)
- 2- 3 **T**op **C**enter edge cubes: (Ponedjeljak, Utorak), (Srijeda, Četvrtak), (Petak, blank\_ **TC**)
- 3- 1 **T**op **R**ight blank corner cube

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: S, V, O, T, L, K, R, P
- 2- 8 **Bottom Center** letters on edge cubes: I, E, Ž, R, V, O, U, T
- 3- 8 **Bottom Right** letters on corner cubes: J, L, U, A, I, P, S, O

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

- 1- 3 **Bottom Left** corner cubes: (S,V,O), (T,L,K), (R,P,blank\_ **TL/TR**)
- 2- 4 **Bottom Center** edge cubes: (I,E), (Ž,R), (V,O), (U,T)
- 3- 3 **Bottom Right** corner cubes: (J,L,U), (A,I,P), (S,O,blank\_ **TL/TR**)

## Croatian 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
Subota, Nedjelja, blank	Ponedjeljak, Utorak, Srijeda, Četvrtak, Petak, 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
S, V, O, T, L, K, R, P	I, E, Ž, R, V, O, U, T, blank	J, L, U, A, I, P, S, O

# Solving a Croatian Calendar Cube Step by Step

In this example, a step by step solving process is applied to the Croatian 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.

**Solve the Cross First**


Standard Rubik's Cube Solving

**Then Solve the Corner Cubes**


Standard Rubik's Cube Solving

**Step 1**

	<b>1</b>	

Center 1 on Front Face

**Step 2**

	Pone- djeljak	
	<b>1</b>	

Top Layer: Edge Понедељак

**Step 3**

	Pone- djeljak	
	<b>1</b>	

Middle Layer: Edge Cube Blank

**Step 4**

	Pone- djeljak	
	<b>1</b>	
	<b>1</b>	

Bottom Layer: Edge Cube 1

**Step 5**

	Pone- djeljak	
0	1	
	I	

Middle Layer: Edge Cube 0

**Step 6**

	Pone- djeljak	
0	1	
	I	

Top Layer: Corner Cube Blank

**Step 7**

	Pone- djeljak	
0	1	
	I	

Top Layer: Corner Cube Blank

**Step 8**

	Pone- djeljak	
0	1	
	I	J

Bottom Layer: Corner Cube J

**Step 9**

	Pone- djeljak	
0	1	
S	I	J

Bottom Layer: Corner Cube S

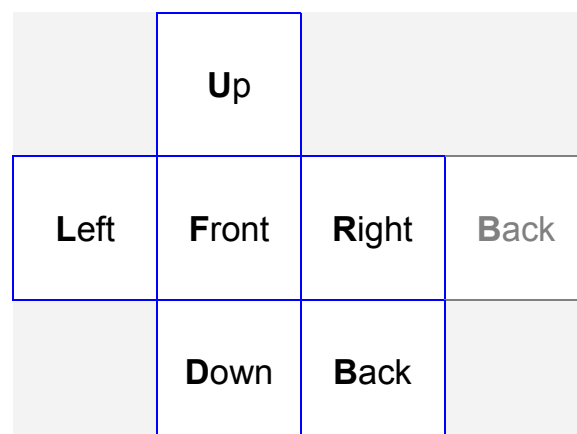
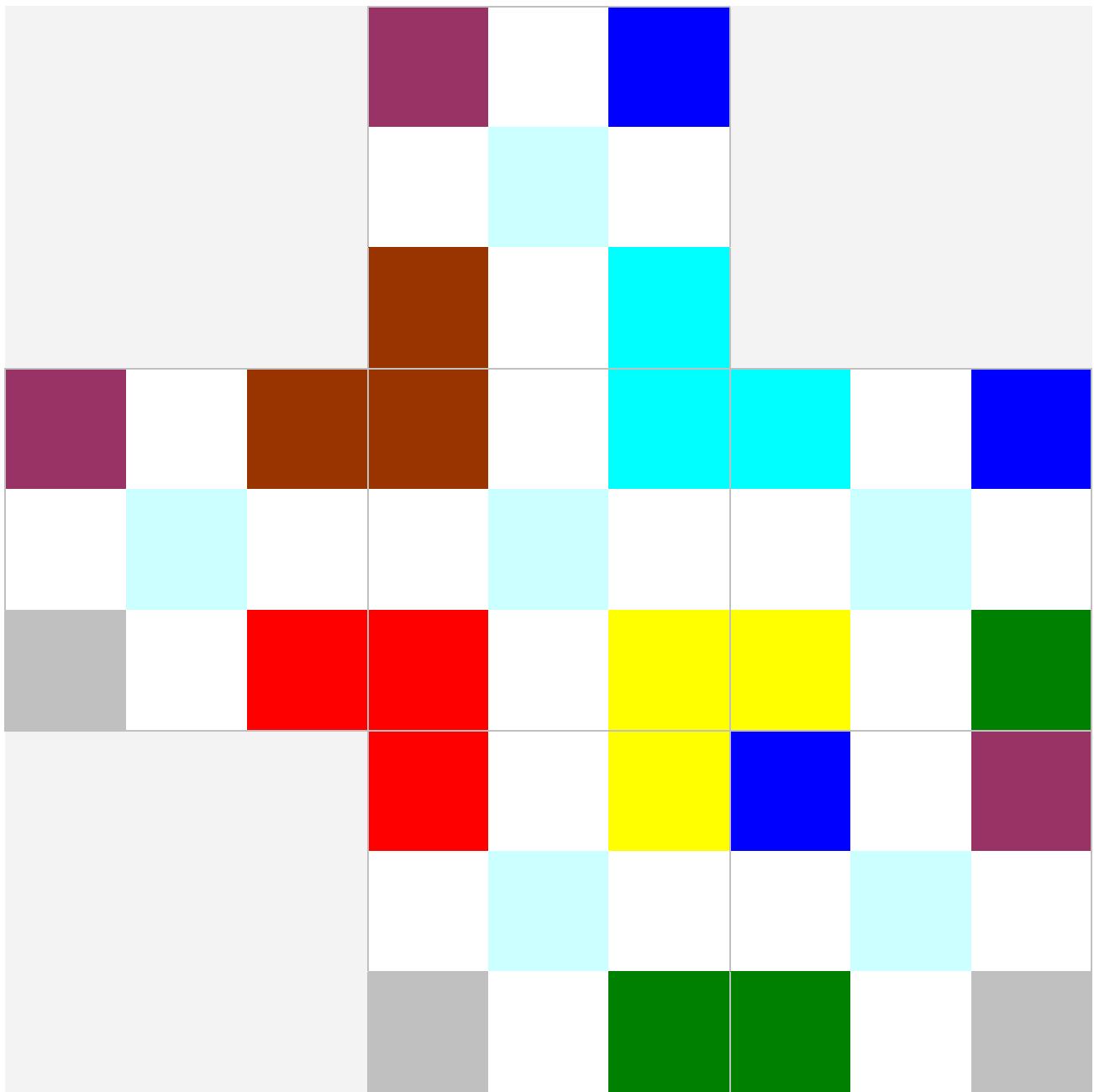
**Step 10**

	Pone- djeljak	
0	1	
S	I	J

That's it !

## Corner Cubes Final Check

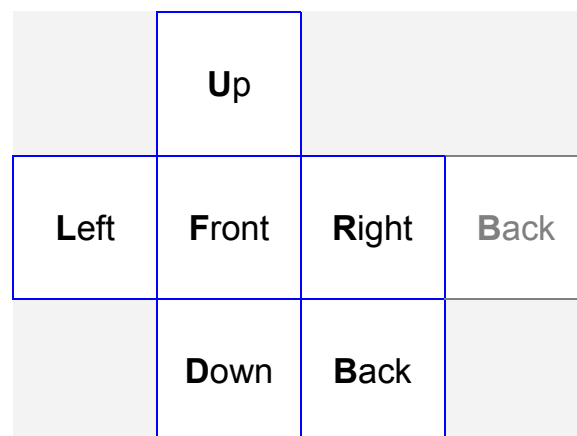
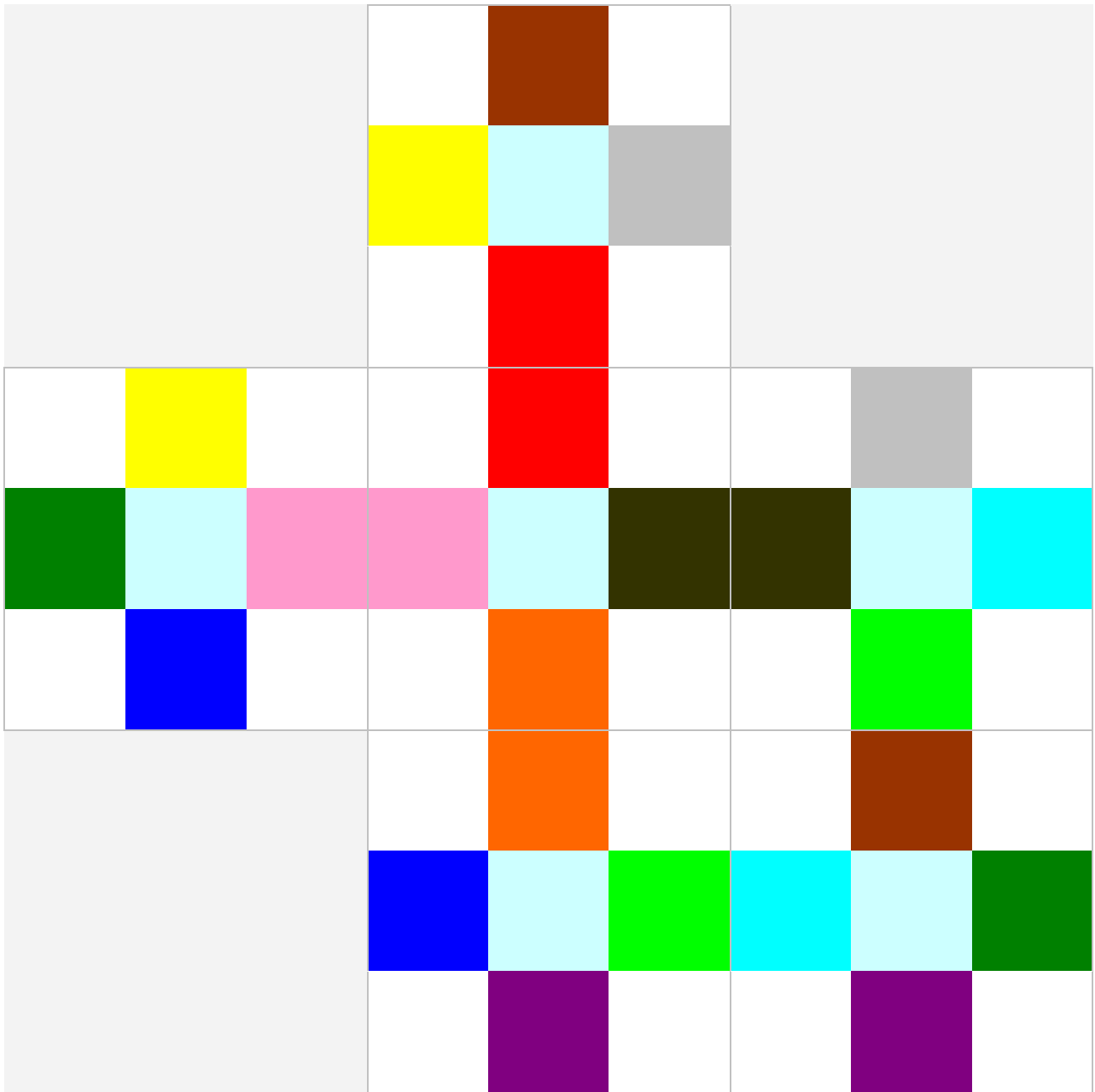
There are 8 Corner Cubes and 3 faces per Corner Cube. In the diagram below, each Corner Cube is displayed in 8 different colors and with the same color applied to each of its 3 faces. This diagram can be used as a convenient *visual aid* to check Design Rules (DRC).





## 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.

