

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

Bulgarian Language – Useful Links	
<a href="http://en.wikipedia.org/wiki/Bulgarian_language">http://en.wikipedia.org/wiki/Bulgarian_language</a>	<a href="http://www.studybulgarian.com/Bulgarian%20alphabet.htm">http://www.studybulgarian.com/Bulgarian%20alphabet.htm</a>
<a href="http://www.mementoslangues.fr/Babel/BabelSlave-A4.pdf">http://www.mementoslangues.fr/Babel/BabelSlave-A4.pdf</a>	

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 Bulgarian Calendar Cube									
		Година							
		Петък	0	Среда					
		Събота		Вторник	Т				
К		Неделя		Понеделник		Ч	Четвъртък		М
	2	1	0	1	2	3	5		
Ю	А	М	Я	Н	У	В	О	О	
			Ф	Е	Р	Г	3	Е	
			П	4	К	7	6	8	
			А	Л	Ц	Н	В	С	



Bulgarian Calendar Cube Texture	Virtual Bulgarian Calendar Cube
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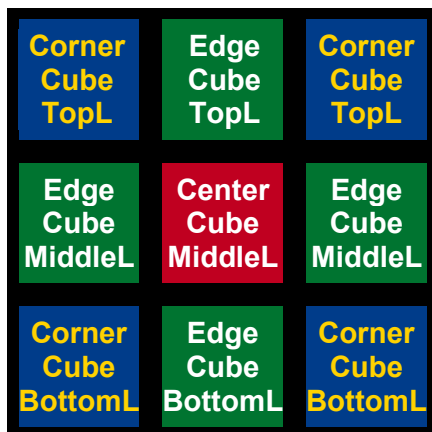
## Design Particularities

The cube can also display the 2 last digits of a year from 00 up to 30 on the **Middle Layer** when 'Година' ('Year' in Bulgarian) is displayed **Top Center** on the **Top Layer**.

The sum of left- and right-hand letters of the 12 Bulgarian abbreviated months equals 19 and the number of center letters equals 8, making this calendar cube as difficult to design as the Spanish calendar cube. The Bulgarian calendar cube design is based on the design of the Spanish calendar cube invented by Alfonso Pérez Arnal and introduced in the Spanish forum ► [El Cubo de Rubik de la A a la Z](#).

## 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

# Bulgarian Calendar Cube Design

## Bulgarian Calendar

Bulgarian Calendar				
Months			Weekdays	
English	Bulgarian		English	Bulgarian
January	<u>Я</u> НУари	Януари	Monday	Понеделник
February	<u>ФЕВ</u> руари	Февруари	Tuesday	Вторник
March	<u>МАР</u> т	Март	Wednesday	Сряда
April	<u>АПР</u> ил	Април	Thursday	Четвъртък
May	<u>МАЙ</u>	Май	Friday	Петък
June	<u>ЮНИ</u>	Юни	Saturday	Събота
July	<u>ЮЛИ</u>	Юли	Sunday	Неделя
August	<u>АВГУ</u> ст	Август		
September	<u>СЕП</u> тември	Септември		
October	<u>ОКТ</u> омври	Октомври		
November	<u>НОЕ</u> мври	Ноември		
December	<u>ДЕК</u> ември	Декември	Year	Година
9 letters on <b>Bottom Left</b> corner cubes			Я Ф М А Ю С О Н Д	
8 letters on <b>Bottom Center</b> cubes			Н Е А П Л В К О	
10 letters on <b>Bottom Right</b> corner cubes			У В Р Й И Г П Т Е К	
'Година' <b>Top Center</b> is a word placed on an edge cube common to both <b>Top</b> and <b>Bottom Layers</b> .				

## 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 **Top Left** weekdays and 1 blank on 1 corner cube: Събота, Неделя, blank\_ **TL/TR** \*
- 2- 5 **Top Center** weekdays and 1 blank on 3 edge cubes: Понеделник, Вторник, Сряда, Четвъртък, Петък, blank\_ **TC**
- 3- 2 blanks on 2 corner cubes from the **Bottom Layer**: blank\_ **TL/TR**, blank\_ **TL/TR** (see **Bottom Layer**) \*

Weekdays are now *logically* combined on corner cubes:

- 1- 1 **Top Left** corner cube: (Събота, Неделя, blank\_ **TL/TR**)
- 2- 3 **Top Center** edge cubes: (Понеделник, Вторник), (Сряда, Четвъртък), (Петък, blank\_ **TC**)

\* This ensures that there is at least 1 blank on a **Top Left** corner cube and 1 blank on a **Top Right** corner cube for days 1 to 5 and 1 blank on a **Top Right** corner cube for days 6 to 7.

So, now there are 7 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, 1 blank, 1 **Top Center** word on edge cubes: 0, 1, 2, 3, blank\_**ML/MR**, Година
- 2- 7 **Middle Center** numbers on center cubes: 0, 1, 2, 3, 4, 6/9
- 3- 3 **Middle Right** numbers, 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,Година)
- 2- 2 **Middle Right** edge cubes: (5,7), (8,blank\_**ML/MR**)

**Note 1:** **Top Center** word 'Година' ('Year' in Bulgarian) is placed on an edge cube common to both **Top** and **Middle Layers**. This word used when displaying the 2 last digits of a year on the **Middle Layer**, from 'Година' 00 up to 'Година' 30, either on the left-hand side or on the right-hand side.

So, now there are 7 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- 9 **Bottom Left** letters on corner cubes: Я, Ф, М, А, Ю, С, О, Н, Д
- 2- 8 **Bottom Center** letters on edge cubes: Н, Е, А, П, Л, В, К, О
- 3- 10 **Bottom Right** letters on corner cubes: У, В, Р, Й, И, Г, П, Т, Е, К

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

- 1- 3 **Bottom Left** corner cubes: (Я,Ф,М), (А,Ю,С), (О,Н,Д)
- 2- 4 **Bottom Center** edge cubes: (Н,Е), (А,П), (Л,В), (К,О)
- 3- 4 **Bottom Right** corner cubes: (У,В,Р), (Й,И,Г), (П,Т,blank\_**TL/TR**), (Е,К,blank\_**TL/TR**)

**Bulgarian Calendar Cube – Layout Table****Reading from Left to Right**

<b>Top Left</b> – Corner cubes	<b>Top Center</b> – Edge cube	<b>Top Right</b> – Corner cube
Събота, Неделя, blank	Понеделник, Вторник, Сряда, Четвъртък, Петък, Година, blank	blank
<b>Middle Left</b> – Edge cubes	<b>Middle Center</b> – Center cubes	<b>Middle Right</b> – Edge cubes
0, 1, 2, 3, blank	0, 1, 2, 3, 4, 6/9	5, 7, 8, blank
<b>Bottom Left</b> – Corner cubes	<b>Bottom Center</b> – Edge cubes	<b>Bottom Right</b> – Corner cubes
Я, Ф, М, А, Ю, С, О, Н, Д	Н, Е, А, П, Л, В, К, О	У, В, Р, Й, И, Г, П, Т, Е, К

# Solving a Bulgarian Calendar Cube Step by Step

In this example, a step by step solving process is applied to the Bulgarian 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**

	1	

Center 1 on Front Face

**Step 2**

	Поне- делник	
	1	

Top Layer: Edge Понеделник

**Step 3**

	Поне- делник	
	1	

Middle Layer: Edge Cube Blank

**Step 4**

	Поне- делник	
	1	
	Н	

Bottom Layer: Edge Cube Н

**Step 5**

	Поне- делник	
0	1	
	Н	

Middle Layer: Edge Cube 0

**Step 6**

	Поне- делник	
0	1	
	Н	

Top Layer: Corner Cube Blank

**Step 7**

	Поне- делник	
0	1	
	Н	

Top Layer: Corner Cube Blank

**Step 8**

	Поне- делник	
0	1	
	Н	у

Bottom Layer: Corner Cube у

**Step 9**

	Поне- делник	
0	1	
Я	Н	у

Bottom Layer: Corner Cube Я

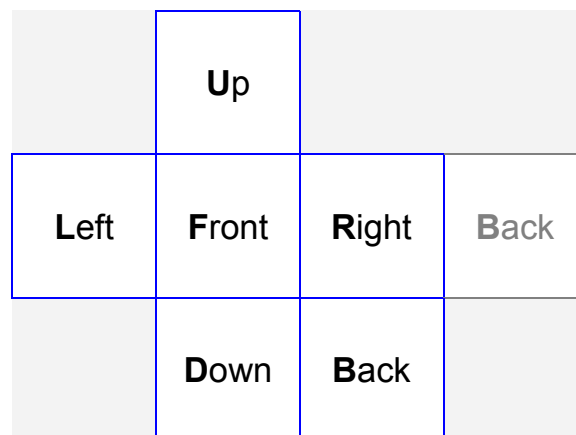
**Step 10**

	Поне- делник	
0	1	
Я	Н	у

That's it !

## Corner Cubes Final Check

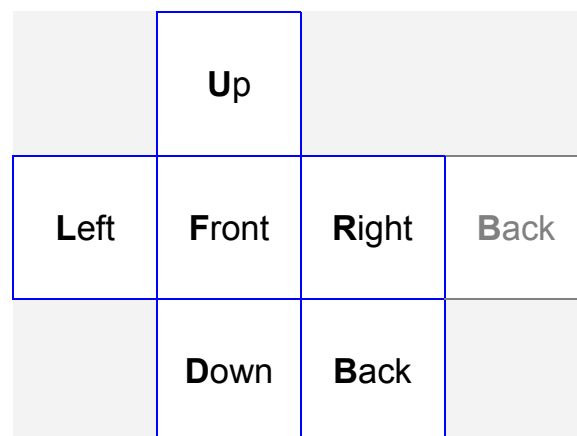
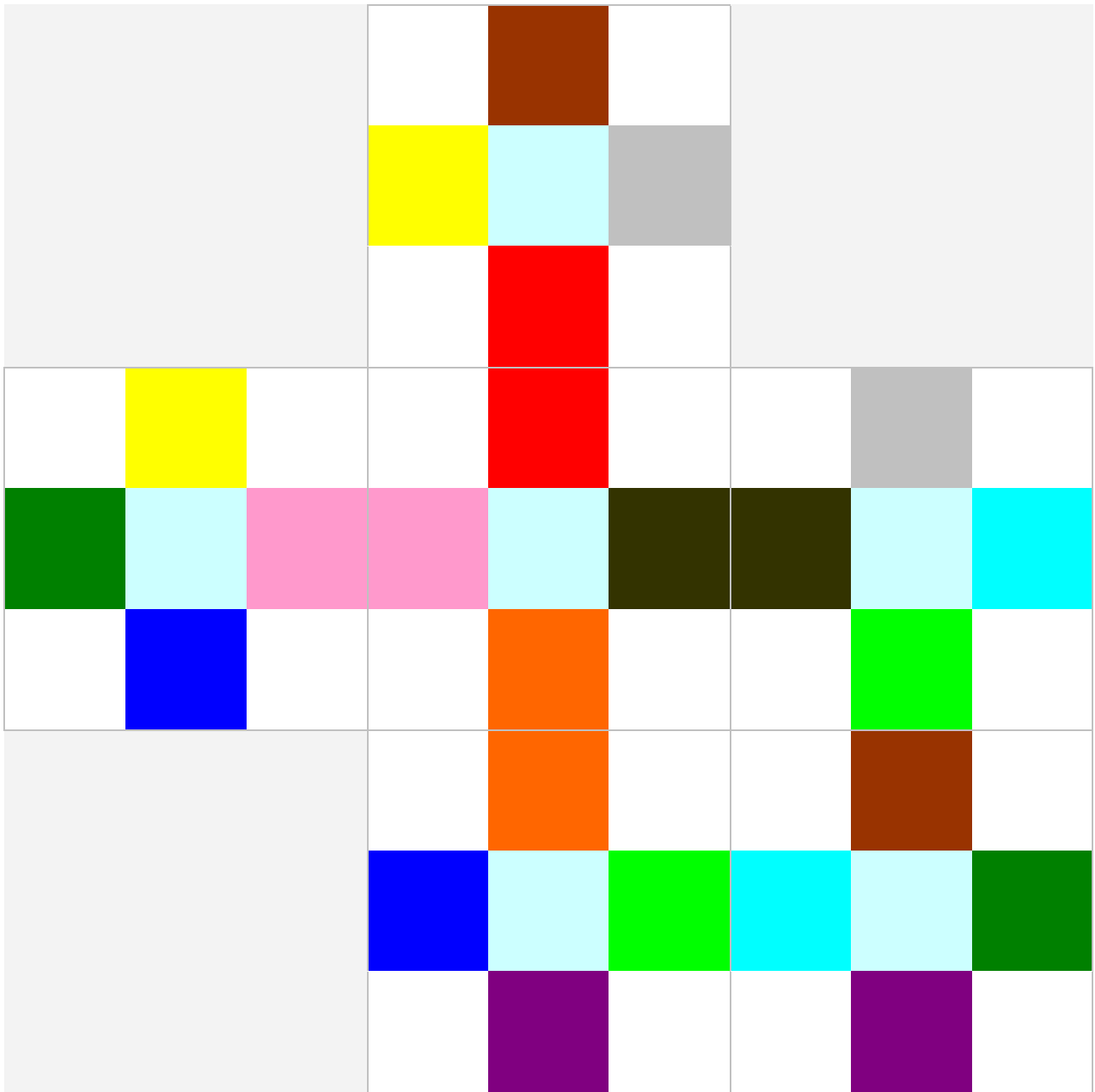
There are 8 Corner Cubes and 3 faces per Corner Cube. In the diagram below, each Corner Cube is displayed in 8 different colors and with the same color applied to each of its 3 faces. This diagram can be used as a convenient *visual aid* to check Design Rules (DRC).





## 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.

