

Malay Calendar Cube Design

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WebSites	http://www.mementoslangues.fr/	http://www.randelshofer.ch/

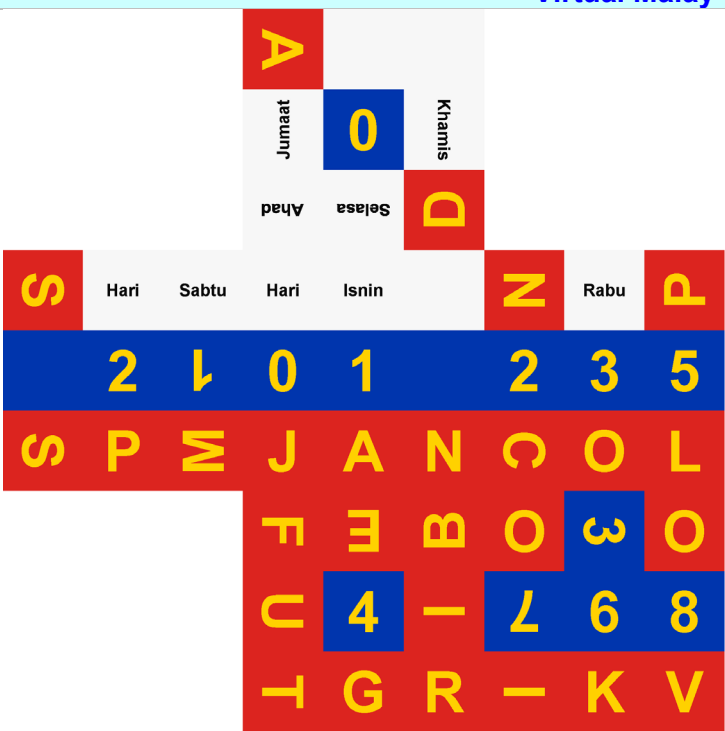

Introduction

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

Malay Language – Useful Links

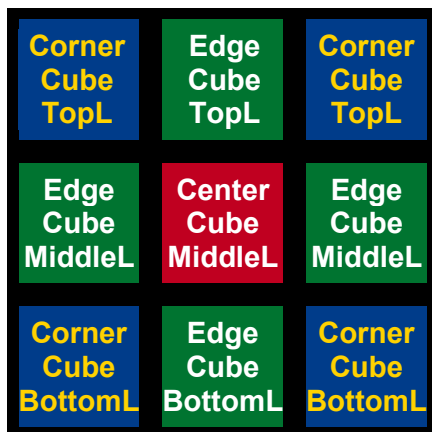
http://en.wikipedia.org/wiki/Malay_language	http://en.wikipedia.org/wiki/Malayic_languages
http://www.mementoslangues.fr/Malais/Cours/BasicCourseInBahasaMalaysia.pdf	

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 Malay Calendar Cube	
	
Malay Calendar Cube Texture	Virtual Malay 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

Malay Calendar Cube Design

Malay Calendar

Malay Calendar				
Months			Weekdays	
English	Malay		English	Malay
January	<u>JAN</u> uari	(bulan) Januari	Monday	(hari) Isnin
February	<u>FEB</u> ruari	(bulan) Februari	Tuesday	(hari) Selasa
March	<u>MAC</u>	(bulan) Mac	Wednesday	(hari) Rabu
April	<u>APR</u> il	(bulan) April	Thursday	(hari) Khamis
May	<u>MEI</u>	(bulan) Mei	Friday	(hari) Jumaat
June	<u>JUN</u>	(bulan) Jun	Saturday	(hari) Sabtu
July	<u>JUL</u> ai	(bulan) Julai	Sunday	(hari) Ahad
August	<u>OGO</u> s	(bulan) Ogos		
September	<u>SEP</u> tember	(bulan) September		
October	<u>OKT</u> ober	(bulan) Oktober		
November	<u>NOV</u> ember	(bulan) November		
December	<u>DIS</u> ember	(bulan) Disember	Day	Hari
8 letters on left-hand corner cubes			J F M A O S N D	
8 letters on edge cubes			A E P U G K O I	
11 letters on right-hand corner cubes			N B C R I L O P T V S	

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- 1 **T**op **L**eft day part on 1 corner cube: Hari_TopLeft
- 2- 5 **T**op **C**enter weekdays and 1 day part on 3 edge cubes: Isnin, Selasa, Rabu, Khamis, Jumaat, Hari
- 3- 2 **T**op **R**ight weekdays on 1 corner cube: Sabtu, Ahad

Weekdays are now combined on corner cubes:

- 1- 3 **T**op **C**enter edge cubes: (Isnin, Selasa), (Rabu, Khamis), (Jumaat, Hari)
- 2- 1 **T**op **R**ight corner cube: (Sabtu, Ahad, Hari_TopLeft)

Note 1: Top Left and Top Right blanks are obtained from **Bottom Layer** corner cubes, depending on displayed month (see **Bottom Layer**).

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**
- 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, blank_**TL/TR**)
- 2- 2 **Middle Right** edge cubes: (5,7), (8,blank_**ML/MR**)

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- 8 **Bottom Left** letters on corner cubes: J, F, M, A, O, S, N, D
- 2- 8 **Bottom Center** letters on edge cubes: A, E, P, U, G, K, O, I
- 3- 11 **Bottom Right** letters on corner cubes: N, B, C, R, I, L, O, P, T, V, S

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

- 1- 3 **Bottom Left** corner cubes: (J,F,M), (A,O,S), (N,D,blank1_**TL/TR**)
- 2- 4 **Bottom Center** edge cubes: (A,E), (P,U), (G,K), (O,I)
- 3- 4 **Bottom Right** corner cubes: (N,B,C), (R,I,L), (O,P,blank2_**TL/TR**), (T,V,S)

Note 2: Top Layer corner blank1 cannot be used for months of November and December and Top Layer corner blank2 cannot be used for months of August and September, but there is *always* one of these two blanks that can be used either **Top Left** or **Top Right**.

Malay Calendar Cube – Layout Table

Reading from Left to Right

Top Left – Corner cubes	Top Center – Edge cube	Top Right – Corner cube
Hari, blank	Isnin, Selasa, Rabu, Khamis, Jumaat, Hari	Sabtu, Ahad, blank
Middle Left – Edge cubes	Middle Center – Center cubes	Middle Right – Edge cubes
0, 1, 2, 3, blank	0, 1, 2, 3, 4, 6/9	5, 7, 8, blank
Bottom Left – Corner cubes	Bottom Center – Edge cubes	Bottom Right – Corner cubes
J, F, M, A, O, S, N, D	A, E, P, U, G, K, O, I	N, B, C, R, I, L, O, P, T, V, S

Solving a Malay Calendar Cube Step by Step

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

	Isnin	
	1	

Top Layer: Edge Isnin

Step 3

	Isnin	
	1	

Middle Layer: Edge Cube **Blank**

Step 4

	Isnin	
	1	
	A	

Bottom Layer: Edge Cube **A**

Step 5

	Isnin	
0	1	
	A	

Middle Layer: Edge Cube 0

Step 6

Hari	Isnin	
0	1	
	A	

Top Layer: Corner Cube Hari

Step 7

Hari	Isnin	
0	1	
	A	

Top Layer: Corner Cube Blank

Step 8

Hari	Isnin	
0	1	
	A	N

Bottom Layer: Corner Cube N

Step 9

Hari	Isnin	
0	1	
J	A	N

Bottom Layer: Corner Cube J

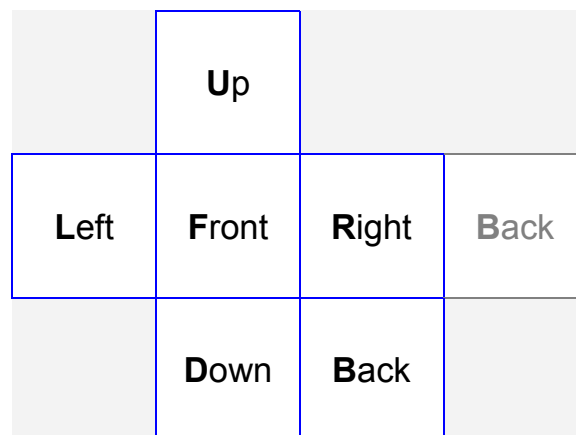
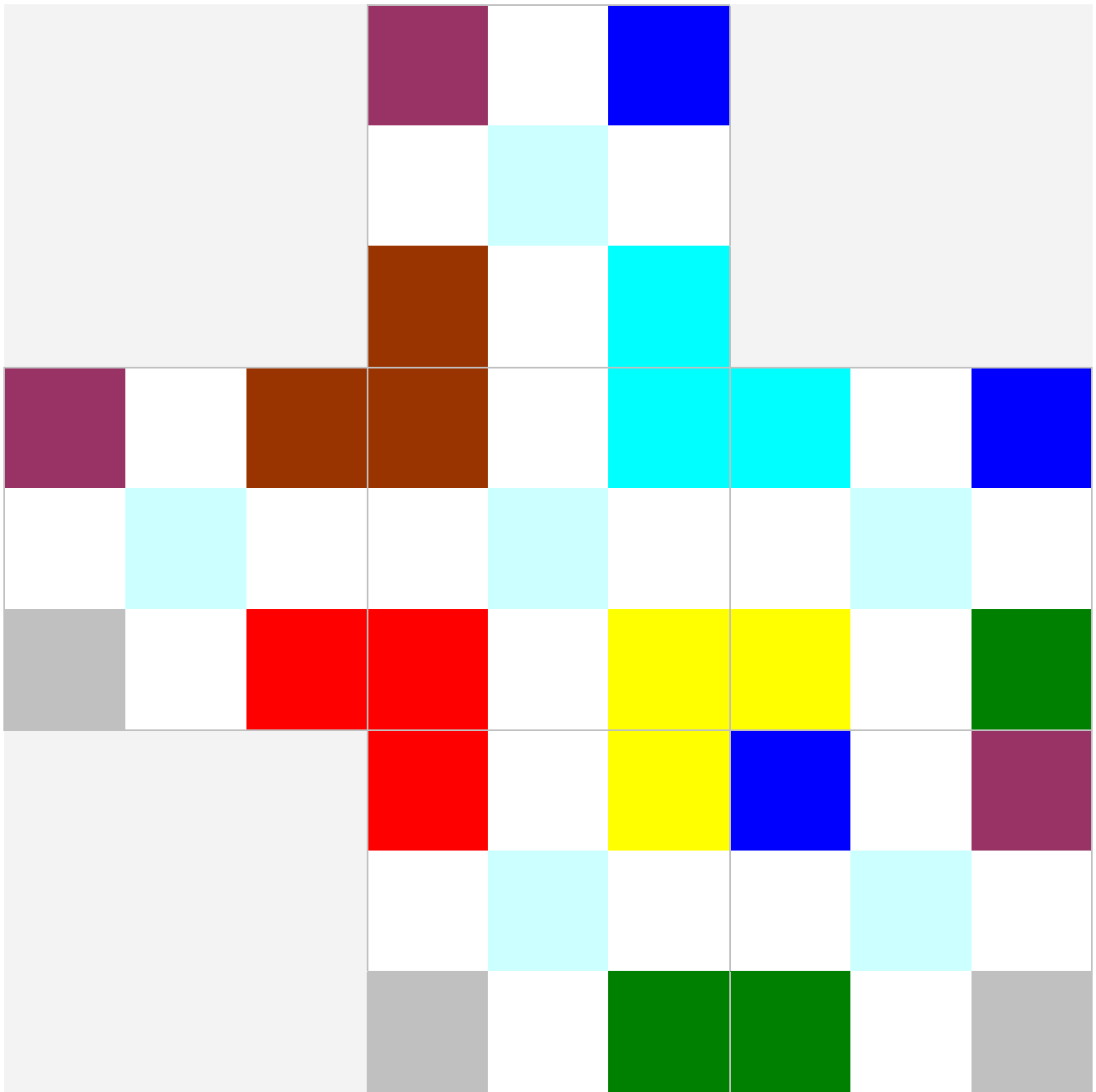
Step 10

Hari	Isnin	
0	1	
J	A	N

That's it !

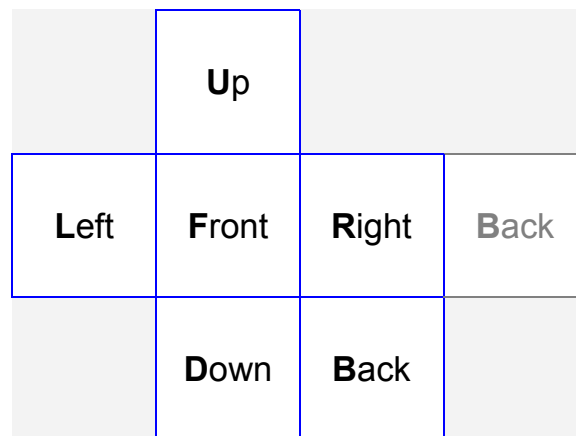
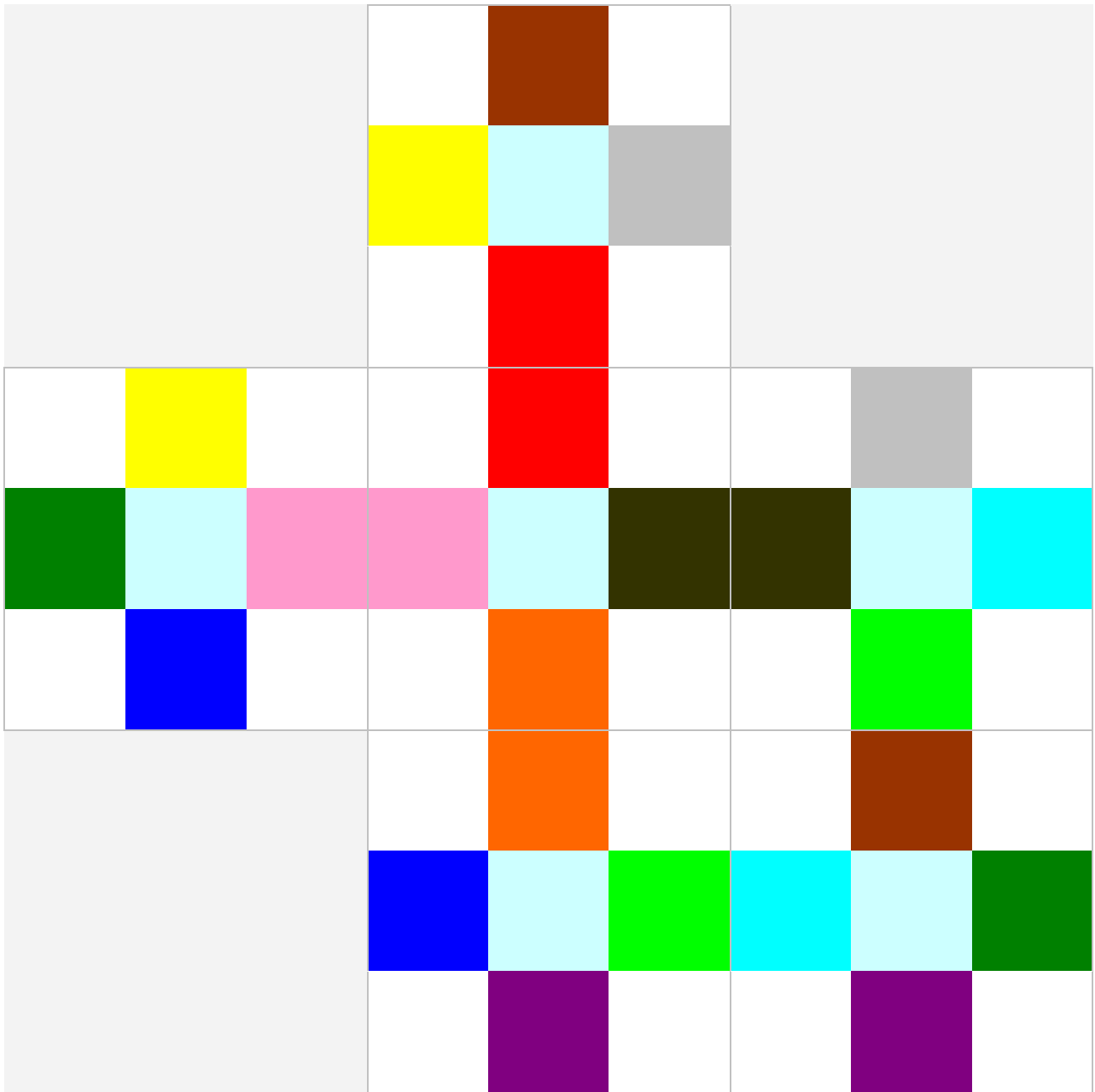
Corner Cubes Final Check

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).



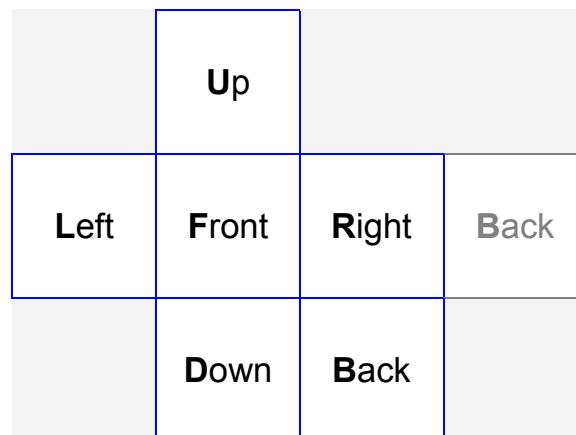
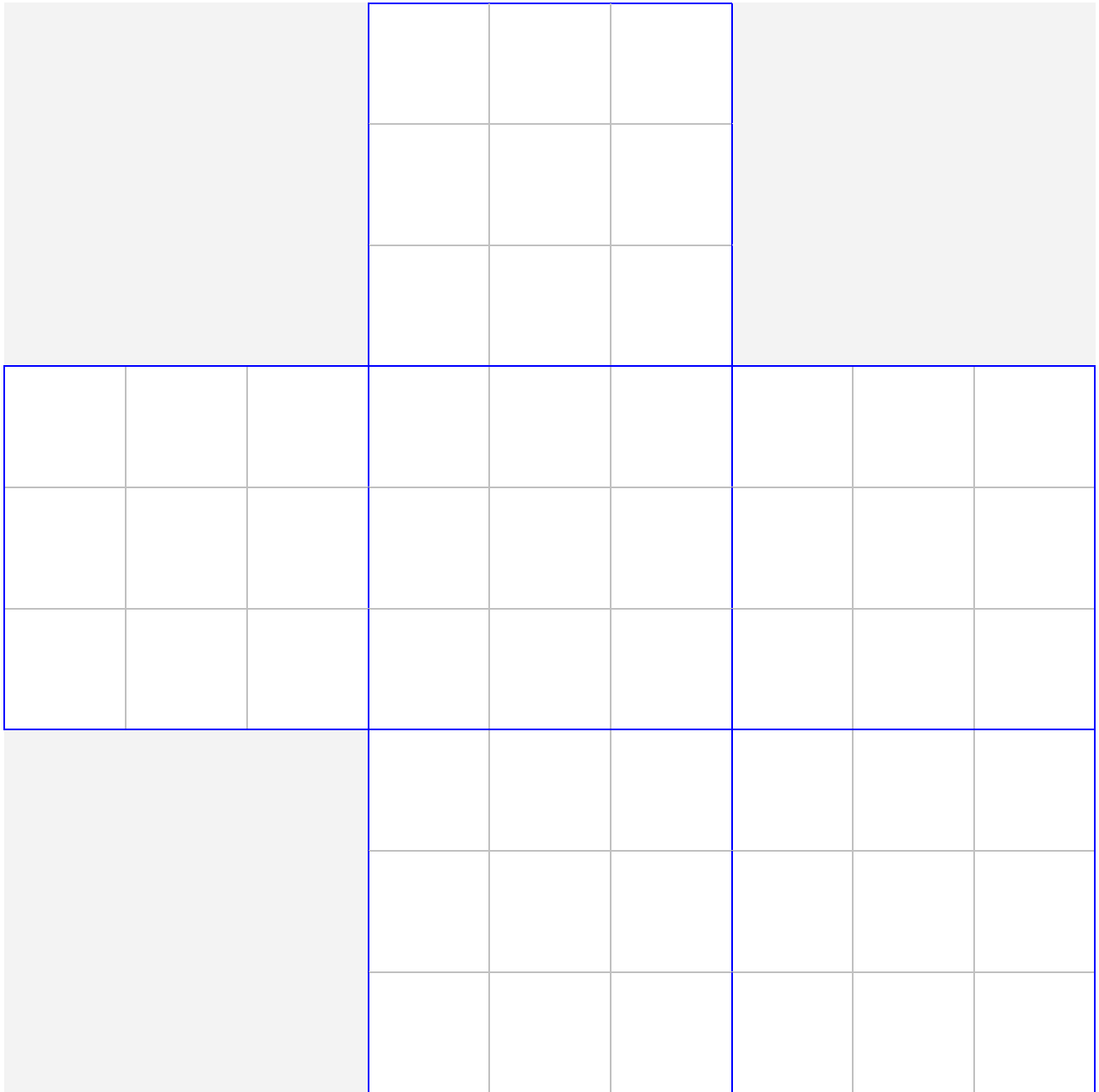
Edge Cubes Final Check

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.



Up

Left

Front

Right

Back

Down

Back