

Standardized Calendar Cube Design

Introduction

There may be some advantages gained by standardizing calendar cube design to ease the creation process of new calendars based on existing ones or to ease the mapping of calendar cube textures into the code of the [CubeSynthesizer](#) computer program.

A standardized design technique has been found for some new or already existing calendar cubes. In order to make calendar cubes good candidates for design standardizing, they should present the following features:

- Months are displayed on the Middle Layer
- A maximum of 8 edge cubes are used on the Middle Layer

This means that there are a maximum of 6 letters displayed **Middle Center** and no more than a total of 16 beginning + end letters displayed **Middle Left** or **Middle Right**.

If these conditions are met, then these calendar cubes can display weekdays on the Top Layer, months on the Middle Layer and days on the Bottom Layer. In addition, they can also display time of the day, temperature and year. The time of the day and temperature can be displayed from 00:00 to 23:59 in :01 (1 minute) steps and from 00 °C to 59 °C in 1 °C steps, respectively. The year can be displayed from '00 (Year 2000) to '59 (Year 2059) in '01 (1 year) steps.

Standardized Calendar Cubes				
French**	Norwegian*	Portuguese*	Romanian**	Rumantsch Grischun*
Designed	Design proposal	Design proposal	Designed	Design proposal

*Textures for these 3 already existing calendar cubes can be downloaded from <http://www.randelshofer.ch/> but these are *not* standardized textures.

**Standardized textures for these 2 calendar cubes have been designed and are described in documents:

[French Calendar Cube Design](#), [Romanian Calendar Cube Design](#)

These 2 textures have not been published yet.

Standardized Norwegian Calendar Cube Design

Norwegian Calendar

Norwegian Calendar				
Months			Weekdays	
English	Norwegian		English	Norwegian
January	<u>JAN</u> uar	Januar	Monday	Mandag
February	<u>FEB</u> ruar	Februar	Tuesday	Tirsdag
March	<u>MAR</u> s	Mars	Wednesday	Onsdag
April	<u>APR</u> il	April	Thursday	Torsdag
May	<u>MAI</u>	Mai	Friday	Fredag
June	<u>JUN</u> i	Juni	Saturday	Lørdag
July	<u>JUL</u> i	Juli	Sunday	Søndag
August	<u>AUG</u> ust	August		
September	<u>SEP</u> tember	September		
October	<u>OKT</u> ober	Oktober		
November	<u>NOV</u> ember	November		
December	<u>DES</u> ember	Desember		
8 letters on Middle Left edge cubes			J F M A S O N D	
6 letters on Middle Center cubes			A E P U K O	
10 letters on Middle Right edge cubes			N B R I L G P T V S	
Symmetrical letters ' S ' and ' N ' are used either Middle Left or Middle Right				

Cube Layout

In this design, weekdays are displayed on **Top Layer**, months on **Middle Layer** and either day of the month or time or temperature or year on **Bottom Layer**.

Top Layer Layout

Norwegian Calendar Cube – Top Layer								
Mandag			Tirsdag			Onsdag		
Man	dag		Tirs	dag		Ons	dag	

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

- 1- 7 **Top Left** weekday parts on corner cubes: Man, Tirs, Ons, Tors, Fre, Lør, Søn
- 2- 1 **Top Center** weekday part on an edge cube: dag
- 3- 1 **Top Right** blank on a corner cube: blank

Weekdays are now *logically* combined on corner cubes:

- 1- 3 **Top Left** corner cubes: (Man, Tirs, Ons), (Tors, Fre, blank*), (Lør, Søn, blank*)
- 2- 1 **Top Center** edge cube: (dag, blank)

*This ensures that there is at least one blank on a **Top Right** corner cube.

So, now there are 5 corner and 11 edge cubes left that can be used for the 2 remaining layers.

Middle Layer Layout



Letters on the Middle Layer are sorted out as follows:

- 1- 8 **Middle Left** letters on edge cubes: J, F, M, A, **S**, O, **N**, D
- 2- 6 **Middle Center** letters on center cubes: A, E, P, U, K, O
- 3- 8 **Middle Right** letters on edge cubes: B, R, I, L, G, P, T, V

Note 1: Middle **Right** letters '**S**' and '**N**' are Middle **Left** letter '**S**' and '**N**' that have been 180° rotated.

Note 2: Some interesting letter combinations such as 'NOR' for NORway may also be displayed.

Letters are now *logically* combined on edge cubes:

- 1- 4 **Middle Left** edge cubes: (J,F), (M,**S**), (A,**O**), (**N**,D)
- 2- 4 **Middle Right** edge cubes: (B,R), (**I**,L), (G,P), (T,V)

Note 3: Letter '**S**' can never be used **Middle Right** when Letter 'M' is used **Middle Left**.

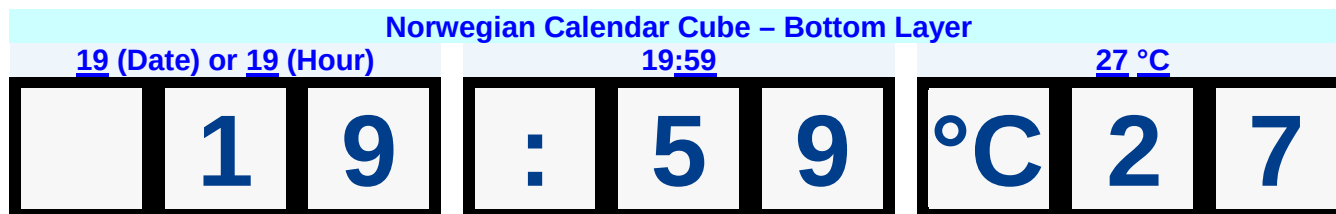
Note 4: Letter '**O**' can never be used **Middle Right** when Letter 'A' is used **Middle Left**.

Note 5: Letter '**N**' can never be used **Middle Right** when Letter 'D' is used **Middle Left**.

Note 6: Letter '**I**' can never be used **Middle Left** when Letter 'L' is used **Middle Right**.

So, now there are 5 corner and 3 edge cubes left that can be used for the Bottom Layer.

Bottom Layer Layout



Numerals and symbols on the Bottom Layer are sorted out as follows:

- 1- 3 **Bottom Left** symbols on a corner cube: ', :, °C (these are used as *selectors*, see **Note 7**)
- 2- 6 **Bottom Center** numerals on edge cubes: 0, 1, 2, 3, 4, 5
- 3- 10 **Bottom Right** numerals on corner cubes: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Numerals and symbols are now *logically* combined on corner and edge cubes:

- 1- 1 **Bottom Left** corner cube: (',:,°C)
- 2- 4 **Bottom Center** edge cubes: (0,1), (2,3), (4,5)
- 3- 4 **Bottom Right** corner cubes: (0,1,2), (3,4,5), (6,7,blank**), (8,9,blank**)

This ensures that there is at least one blank on a **Bottom Left corner cube.

Note 7: symbols ', :, °C are used as *selectors* for selecting display of Year ('), Time (:) or Temperature (°C)

Norwegian Calendar Cube – Layout Table

Reading from Left to Right

Top L eft – Corner cubes	Top C enter – Edge cube	Top R ight – Corner cube
Man, Tirs, Ons, Tors, Fre, Lør, Søn	dag, blank	blank
Middle L eft – Edge cubes	Middle C enter – Center cubes	Middle R ight – Edge cubes
J, F, M, S , A, O , N , D, (I)	A, E, P, U, K, O	B, R, I , L, G, P, T, V, (S , O , N)
Bottom L eft – Corner cubes	Bottom C enter – Edge cubes	Bottom R ight – Corner cubes
blank, ', :, °C	0, 1, 2, 3, 4, 5	0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Standardized Portuguese Calendar Cube Design

Portuguese Calendar

Portuguese Calendar				
Months			Weekdays	
English	Portuguese		English	Portuguese
January	<u>JAN</u> eiro	Janeiro	Monday	Segunda-feira
February	<u>FEV</u> ereiro	Fevereiro	Tuesday	Terça-feira
March	<u>MAR</u> ço	Março	Wednesday	Quarta-feira
April	<u>ABR</u> il	Abril	Thursday	Quinta-feira
May	<u>MAI</u> o	Maio	Friday	Sexta-feira
June	<u>JUN</u> ho	Junho	Saturday	Sábado
July	<u>JUL</u> ho	Julho	Sunday	Domingo
August	<u>AGO</u> sto	Agosto		
September	<u>SET</u> embro	Setembro		
October	<u>OUT</u> ubro	Outubro		
November	<u>NOV</u> embro	Novembro		
December	<u>DEZ</u> embro	Dezembro		
8 letters on Middle Left edge cubes			J F M A S O N D	
6 letters on Middle Center cubes			A E B U G O	
8 letters on Middle Right edge cubes			N V R I L O T Z	
Symmetrical letters ' O ' and ' N ' are used either Middle Left or Middle Right				

Cube Layout

In this design, weekdays are displayed on **Top Layer**, months on **Middle Layer** and either day of the month or time or temperature or year on **Bottom Layer**.

Top Layer Layout

Portuguese Calendar Cube – Top Layer								
Quinta-feira			Sexta-feira			Sábado		
Quinta	-feira		Sexta	-feira		Sábad	o	

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

- 1- 7 **T**op **L**eft weekday parts on corner cubes: Segunda, Terça, Quarta, Quinta, Sexta, Sábad, Doming
- 2- 2 **T**op **C**enter weekday parts on an edge cube: -feira, o
- 3- 1 **T**op **R**ight blank on a corner cube: blank

Weekdays are now *logically* combined on corner cubes:

- 1- 3 **T**op **L**eft corner cubes: (Segunda, Terça, Quarta), (Quinta, Sexta, blank*), (Sábad, Doming, blank*)
- 2- 1 **T**op **C**enter edge cube: (-feira, o)

*This ensures that there is at least one blank on a **Top Right** corner cube.

So, now there are 5 corner and 11 edge cubes left that can be used for the 2 remaining layers.

Middle Layer Layout



Letters on the Middle Layer are sorted out as follows:

- 1- 8 **Middle Left** letters on edge cubes: J, F, M, A, **S**, **O**, **N**, D
- 2- 6 **Middle Center** letters on center cubes: A, E, B, U, G, O
- 3- 6 **Middle Right** letters on edge cubes: B, R, I, L, G, P, T, V
- 4- 2 **Middle Left** additional letters on edge cubes: P, C (see **Note 2**)

Note 1: Middle **Right** letters '**S**' and '**N**' are Middle **Left** letter '**S**' and '**N**' that have been 180° rotated.

Note 2: There are also some interesting letter combinations that can be displayed such as 'POR' (PORTugal or PORTo), COI (COLImbra), FUN (FUNchal) or SET (SETubal).

Letters are now *logically* combined on edge cubes:

- 1- 4 **Middle Left** edge cubes: (J,F), (M,**S**), (A,**O**), (**N**,D)
- 2- 4 **Middle Right** edge cubes: (B,R), (**I**,L), (G,P), (T,V)

Note 3: Letter '**S**' can never be used **Middle Right** when Letter 'M' is used **Middle Left**.

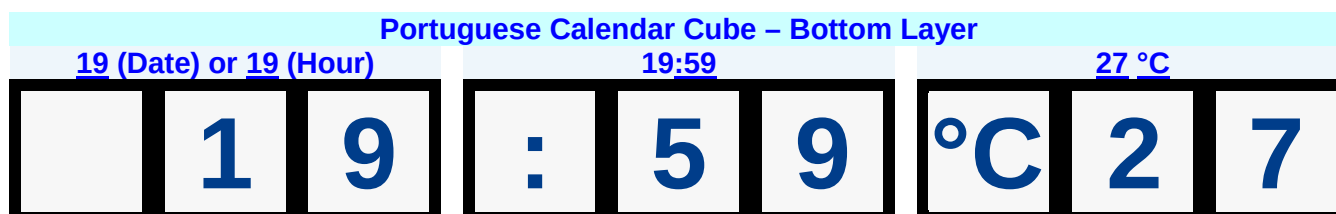
Note 4: Letter '**O**' can never be used **Middle Right** when Letter 'A' is used **Middle Left**.

Note 5: Letter '**N**' can never be used **Middle Right** when Letter 'D' is used **Middle Left**.

Note 6: Letter '**I**' can never be used **Middle Left** when Letter 'L' is used **Middle Right**.

So, now there are 5 corner and 3 edge cubes left that can be used for the Bottom Layer.

Bottom Layer Layout



Numerals and symbols on the Bottom Layer are sorted out as follows:

- 1- 3 **Bottom Left** symbols on a corner cube: ' , : , °C (these are used as *selectors*, see **Note 7**)
- 2- 6 **Bottom Center** numerals on edge cubes: 0, 1, 2, 3, 4, 5
- 3- 10 **Bottom Right** numerals on corner cubes: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Numerals and symbols are now *logically* combined on corner and edge cubes:

- 1- 1 **Bottom Left** corner cube: (' , : , °C)
- 2- 4 **Bottom Center** edge cubes: (0,1), (2,3), (4,5)
- 3- 4 **Bottom Right** corner cubes: (0,1,2), (3,4,5), (6,7,blank**), (8,9,blank**)

This ensures that there is at least one blank on a **Bottom Left corner cube.

Note 7: symbols ' , : , °C are used as *selectors* for selecting display of Year ('), Time (:) or Temperature (°C)

Portuguese Calendar Cube – Layout Table

Reading from Left to Right

Top L eft – Corner cubes	Top C enter – Edge cube	Top R ight – Corner cube
Segunda, Terça, Quarta, Quinta, Sexta, Sábado, Domingo	-feira, o	blank
Middle L eft – Edge cubes	Middle C enter – Center cubes	Middle R ight – Edge cubes
J, F, M, S , A, O , N , D, (I)	A, E, P, U, K, O	B, R, I , L, G, P, T, V, (S , O , N)
Bottom L eft – Corner cubes	Bottom C enter – Edge cubes	Bottom R ight – Corner cubes
blank, ', :, °C	0, 1, 2, 3, 4, 5	0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Standardized Rumantsch Grischun Calendar Cube Design

Rumantsch Grischun Calendar

Rumantsch Grischun Calendar					
Months			Weekdays		
English	Rumantsch Grischun		English	Rumantsch Grischun	
January	<u>SCH</u> aner	Schaner	Monday	Glindesdi	
February	<u>FAV</u> rer	Favrer	Tuesday	Mardi	
March	<u>MAR</u> s	Mars	Wednesday	Mesemna	
April	<u>AVR</u> igl	Avrigl	Thursday	Gievgia	
May	<u>MAT</u> g	Matg	Friday	Venderdi	
June	<u>ZER</u> cladur	Zercladur	Saturday	Sonda	
July	<u>FAN</u> adur	Fanadur	Sunday	Dumengia	
August	<u>AVU</u> st	Avust			
September	<u>SET</u> tember	Settember			
October	<u>OCT</u> ober	October			
November	<u>NOV</u> ember	November			
December	<u>DEC</u> ember	December			
8 letters on M iddle L eft edge cubes			S F M A Z O N D		
5 letters on M iddle C enter cubes			C A V E O		
8 letters on M iddle R ight edge cubes			H V I R T N U C		
Symmetrical letter 'N' is used either M iddle L eft or M iddle R ight					

Cube Layout

In this design, weekdays are displayed on **Top Layer**, months on **Middle Layer** and either day of the month or time or temperature or year on **Bottom Layer**.

Top Layer Layout

Rumantsch Grischun Calendar Cube – Top Layer								
Mardi			Venderdi			Sonda		
Mar	di		Vender	di		Sonda		

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

- 1- 7 **T**op **L**eft weekday parts on corner cubes: Glindes, Mar, Mesemna, Gievgia, Vender, Sonda, Dumengia
- 2- 2 **T**op **C**enter weekday parts on an edge cube: di, blank
- 3- 1 **T**op **R**ight blank on a corner cube: blank

Weekdays are now *logically* combined on corner cubes:

- 1- 3 **T**op **L**eft corner cubes: (Glindes, Mar, Mesemna), (Gievgia, Vender, blank*), (Sonda, Dumengia, blank*)
- 2- 1 **T**op **C**enter edge cube: (di, blank)

*This ensures that there is at least one blank on a **Top Right** corner cube.

So, now there are 5 corner and 11 edge cubes left that can be used for the 2 remaining layers.

Middle Layer Layout



Letters on the Middle Layer are sorted out as follows:

- 1- 8 **Middle Left** letters on edge cubes: S, F, M, A, **Z**, **O**, **N**, D
- 2- 5 **Middle Center** letters on center cubes: C, A, V, E, O
- 3- 8 **Middle Right** letters on edge cubes: **H**, V, **I**, R, T, **N**, U, C **Middle Right**
- 4- 1 **Middle Center** additional letter: R
- 5- 1 **Middle Left** additional letter: G, combined with C **Middle Right**

Note 1: Middle **Right** letter '**N**' is Middle **Left** letter '**N**' that has been 180° rotated.

Note 2: Some interesting letter combinations such as 'GRI' for GRIschun may also be displayed.

Letters are now combined on edge cubes:

- 1- 5 **Middle Left** edge cubes: (**S**,F), (M,**Z**), (A,**O**), (**N**,D), (G,C **Middle Right**)
- 2- 3 **Middle Right** edge cubes: (**H**,V), (**I**,R), (T,U)

Note 3: Letter '**N**' can never be used **Middle Right** when Letter 'D' is used **Middle Left**.

Note 4: Letter '**S**' can never be used **Middle Right** when Letter 'F' is used **Middle Left**.

Note 5: Letter '**Z**' can never be used **Middle Right** when Letter 'M' is used **Middle Left**.

Note 6: Letter '**O**' can never be used **Middle Right** when Letter 'A' is used **Middle Left**.

Note 7: Letter '**H**' can never be used **Middle Left** when Letter 'V' is used **Middle Right**.

Note 8: Letter '**I**' can never be used **Middle Left** when Letter 'R' is used **Middle Right**.

So, now there are 5 corner and 3 edge cubes left that can be used for the Bottom Layer.

Bottom Layer Layout



Numerals and symbols on the Bottom Layer are sorted out as follows:

- 1- 3 **Bottom Left** symbols on a corner cube: ', : , °C (these are used as *selectors*, see **Note 9**)
- 2- 6 **Bottom Center** numerals on edge cubes: 0, 1, 2, 3, 4, 5
- 3- 10 **Bottom Right** numerals on corner cubes: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Numerals and symbols are now *logically* combined on corner and edge cubes:

- 1- 1 **Bottom Left** corner cube: (',: , °C)
- 2- 4 **Bottom Center** edge cubes: (0,1), (2,3), (4,5)
- 3- 4 **Bottom Right** corner cubes: (0,1,2), (3,4,5), (6,7,blank**), (8,9,blank**)

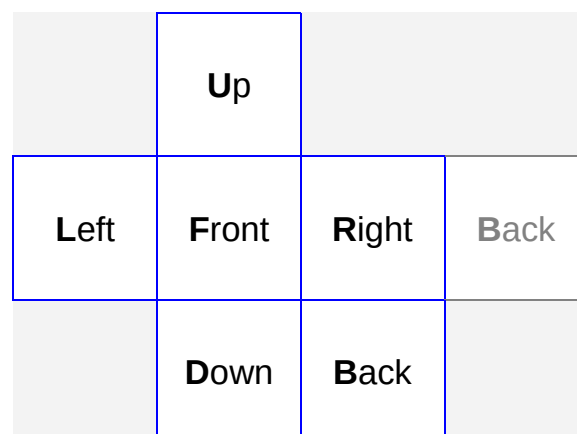
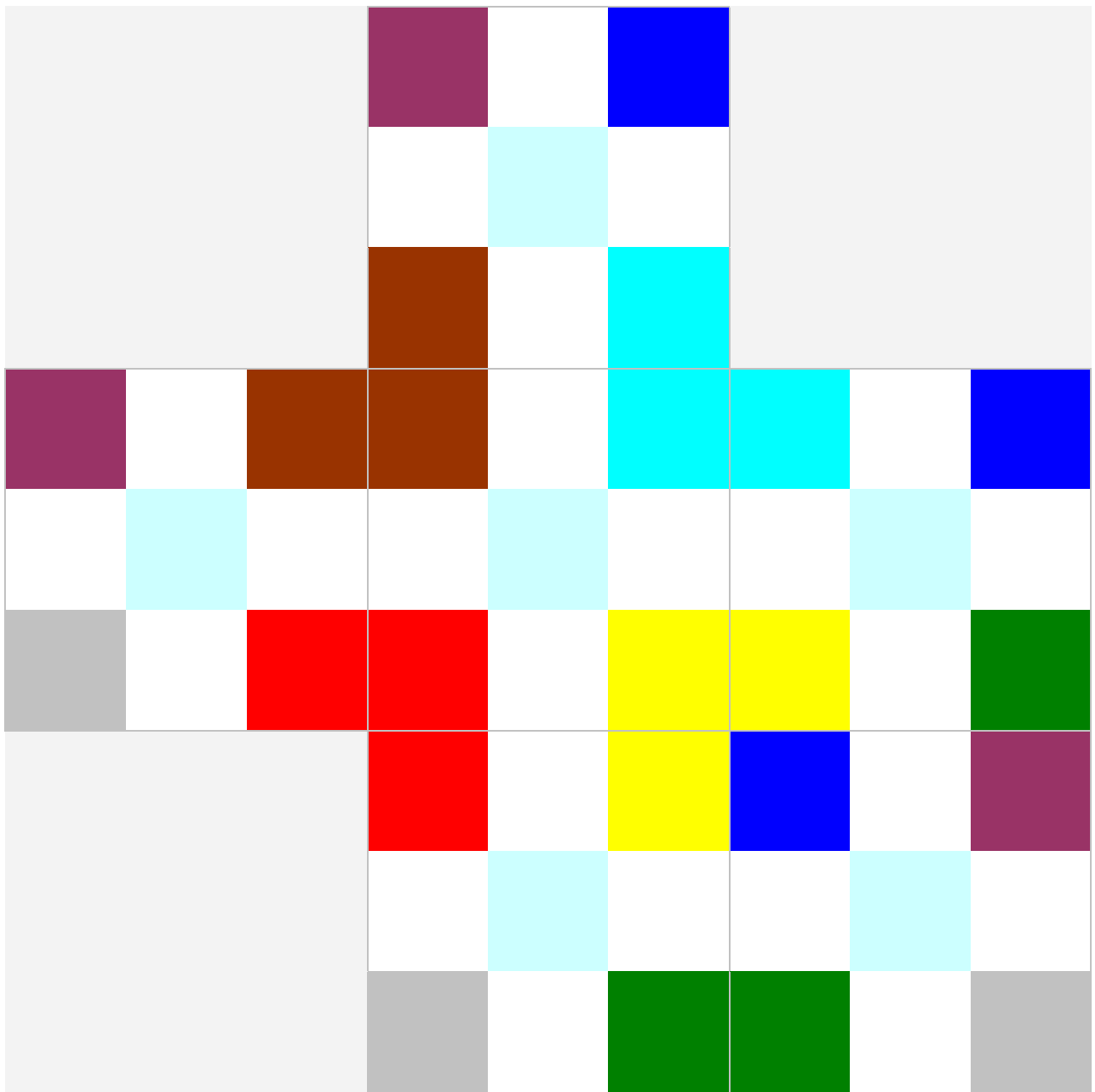
This ensures that there is at least one blank on a **Bottom Left corner cube.

Note 9: symbols ', : , °C are used as *selectors* for selecting display of Year ('), Time (:) or Temperature (°C)

Rumantsch Grischun Calendar Cube – Layout Table		
Reading from Left to Right		
Top L eft – Corner cubes	Top C enter – Edge cube	Top R ight – Corner cube
Glindes, Mar, Mesemna, Gievgia, Vender, Sonda, Dumengia	di, blank	blank
Middle L eft – Edge cubes	Middle C enter – Center cubes	Middle R ight – Edge cubes
S , F, M, Z, A, O , N , D, G, (I , H)	C, A, V, E, O, R	H , V, I , R, T, U, T, V, C, (S , O , N)
Bottom L eft – Corner cubes	Bottom C enter – Edge cubes	Bottom R ight – Corner cubes
blank, ', :, °C	0, 1, 2, 3, 4, 5	0, 1, 2, 3, 4, 5, 6, 7, 8, 9

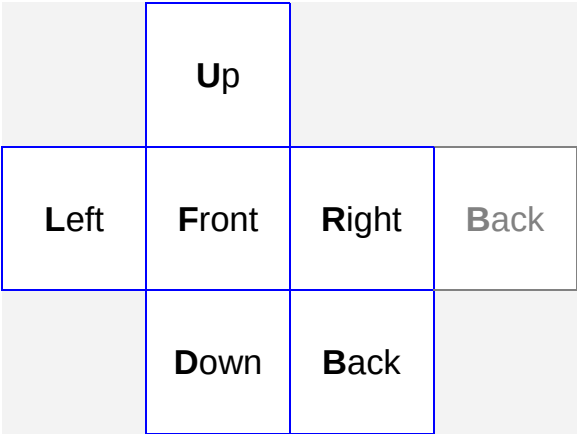
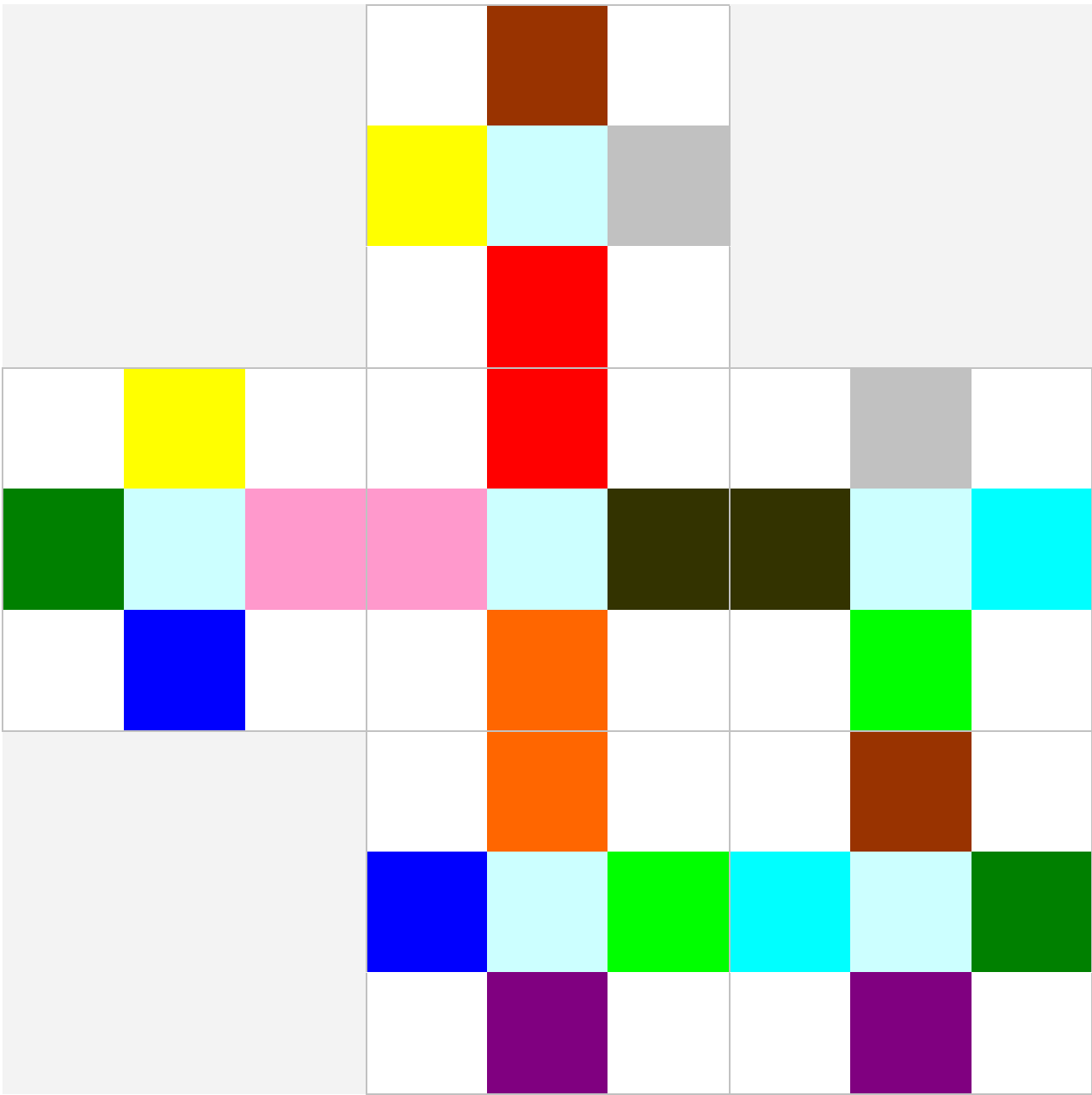
Corner Cubes Final Check

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.

