

# Constellation & Star Names Cube Design

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## Introduction

A **Constellation & Star Names Cube** is a 3x3x3 **Rubik's Cube** used to display some *selected* Constellation and Star Names.

Star Names – Useful Links
<a href="http://en.wikipedia.org/wiki/List_of_constellations">http://en.wikipedia.org/wiki/List_of_constellations</a>
<a href="http://en.wikipedia.org/wiki/List_of_stars_by_constellation">http://en.wikipedia.org/wiki/List_of_stars_by_constellation</a>
<a href="http://en.wikipedia.org/wiki/List_of_constellations_by_area">http://en.wikipedia.org/wiki/List_of_constellations_by_area</a>
<a href="http://en.wikipedia.org/wiki/List_of_traditional_star_names">http://en.wikipedia.org/wiki/List_of_traditional_star_names</a>
<a href="http://en.wikipedia.org/wiki/List_of_brightest_stars">http://en.wikipedia.org/wiki/List_of_brightest_stars</a>

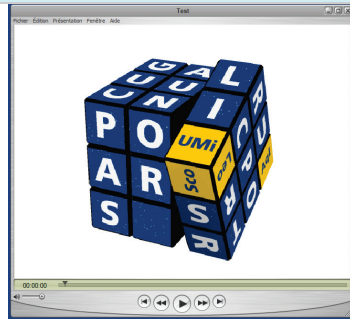
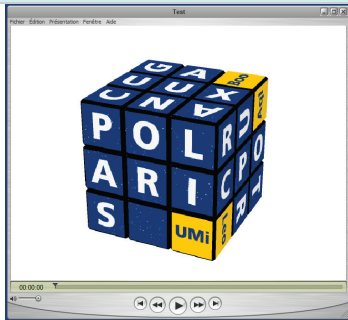
There are **Virtual Cubes** that can be *virtually* rotated and twisted on a computer screen and **Real Cubes** that can only be *physically* rotated and twisted by hand. A **Texture** is laid down on a Virtual Cube whereas real **Stickers** are stuck down on a Real Cube. A Constellation & Star Names Cube is designed by placing letters on a texture which is then laid down on a Virtual Cube (see <http://www.randelshofer.ch/> for more details). Many Constellation and Star Names 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, where POLARIS ( $\alpha$  UMi) and UMi (Ursa Minor) are displayed on a solved front face.

Constellation & Star Names Cube	
<p>Constellation &amp; Star Names Cube</p> <p>Original design 2008 by André Boulouard and Walter Randelshofer</p>	<p>Copyright © 2008 André Boulouard Walter Randelshofer Werner Randelshofer All rights reserved.</p>
Constellation & Star Names Cube Texture	Constellation & Star Names Cube
Download <b>CubeTwister</b> from: <a href="http://www.randelshofer.ch/">http://www.randelshofer.ch/</a>	

Designing a Constellation & Star Names Cube that *works* is definitely not a trivial task but **Design Rules** exist that should be applied. Because it is nearly impossible to test all configurations, the placement of numbers and letters on a texture should be carefully checked at *the end* of the design process. This is carried out by applying a **Design Rules Check (DRC)** in the final design stage.

## Quick Time Movie Example



Initial State (POLARIS-UMi)

Next State

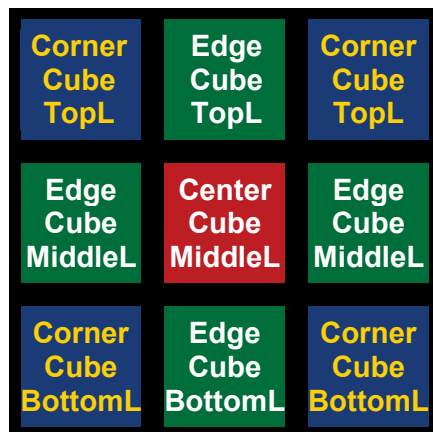
Next State

Final State (SIRIUS-CMa)

A script can be exported from Cube Twister as a Quick Time Movie

## 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
cubeie, 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

# Constellation and Star Names

Star Names						
Star Names in CAPITAL LETTERS are on the Cube						
#	Constellation		α Star		NAME on the Cube	
1	Andromeda	And	α And	Alpheratz, Sirrah		
2	Antlia	Ant	α Ant			
3	Apus	Aps	α Aps			
4	Aquarius	Aqr	α Aqr	Sadalmelik		
5	Aquila	Aql	α Aql	Altair	α Aql	ALTAIR
6	Ara	Ara	α Ara	Choo		
7	Aries	Ari	α Ari	Hamal		
8	Auriga	Aur	α Aur	Capella		
9	Boötes	Boo	α Boo	Arcturus	α Boo	ARCTURUS
10	Caelum	Cae	α Cae			
11	Camelopardalis	Cam	α Cam			
12	Cancer	Cnc	α Cnc	Acubens	β Cnc	ALTARF
13	Canes Venatici	CVn	α CVn	Cor Caroli		
14	Canis Major	CMA	α CMA	Sirius	α CMA	SIRIUS
15	Canis Minor	CMi	α CMi	Procyon	α CMi	PROCYON
16	Capricornus	Cap	α Cap	Al Giedi		
17	Carina	Car	α Car	Canopus	α Car	CANOPUS
18	Cassiopeia	Cas	α Cas	Schedar, Shedar		
19	Centaurus	Cen	α Cen	Rigel Kentaurus	α Cen	RIGIL, RIGEL
20	Cepheus	Cep	α Cep	Alderamin	γ Cep	ALRAI
21	Cetus	Cet	α Cet	Menkar, Menkab		
22	Chamaeleon	Cha	α Cha			
23	Circinus	Cir	α Cir			
24	Columba	Col	α Col	Phact, Phaet		
25	Coma Berenices	Com	α Com	Diadem, Al Dafira		
26	Corona Australis	CrA	α CrA	Alphecca Meridiana		
27	Corona Borealis	CrB	α CrB	Gemma, Alphecca		
28	Corvus	Crv	α Crv	Alchiba		
29	Crater	Crt	α Crt	Alkes		
30	Crux	Cru	α Cru	Acrux		
31	Cygnus	Cyg	α Cyg	Deneb		
32	Delphinus	Del	α Del	Sualocin		
33	Dorado	Dor	α Dor			
34	Draco	Dra	α Dra	Thuban	δ Dra	ALTAIS
35	Equuleus	Equ	α Equ	Kitalpha		
36	Eridanus	Eri	α Eri	Achernar		
37	Fornax	For	α For			
38	Gemini	Gem	α Gem	Castor	β Gem	POLLUX
39	Grus	Gru	α Gru	Alna'ir	α Gru	ALNAIR
40	Hercules	Her	α Her	Ras Algethi		
41	Horologium	Hor	α Hor			
42	Hydra	Hya	α Hya	Alphard		
43	Hydrus	Hyi	α Hyi			
44	Indus	Ind	α Ind	Alnair		
45	Lacerta	Lac	α Lac			
46	Leo	Leo	α Leo	Regulus	α Leo	REGULUS
46	Leo	Leo	α Leo	Regulus	λ Leo	ALTERF
47	Leo Minor	LMi	α LMi			
48	Lepus	Lep	α Lep	Arneb		
49	Libra	Lib	α Lib	Zubenelgenubi		
50	Lupus	Lup	α Lup	Men		
51	Lynx	Lyn	α Lyn			
52	Lyra	Lyr	α Lyr	Vega		
53	Mensa	Men	α Men			
54	Microscopium	Mic	α Mic			

55	Monoceros	Mon	α Mon			
56	Musca	Mus	α Mus	Myia		
57	Norma	Nor	α Nor			
58	Octans	Oct	α Oct	Polaris Australis	σ Oct	POLARIS
59	Ophiuchus	Oph	α Oph	Ras Alhague		
60	Orion	Ori	α Ori	Betelgeuse	β Ori	RIGEL
61	Pavo	Pav	α Pav	Peacock		
62	Pegasus	Peg	α Peg	Markab		
63	Perseus	Per	α Per	Mirfak	β Per	ALGOL
64	Phoenix	Phe	α Phe	Ankaa		
65	Pictor	Pic	α Pic			
66	Pisces	Psc	α Psc	Al Rescha, Al Rischa		
67	Piscis Austrinus	PsA	α PsA	Fomalhaut		
68	Puppis	Pup	α Pup			
69	Pyxis	Pyx	α Pyx	Al Sumut		
70	Reticulum	Ret	α Ret			
71	Sagitta	Sge	α Sge	Sham, Al Sham		
72	Sagittarius	Sgr	α Sgr	Rukbat		
73	Scorpius	Sco	α Sco	Antares	α Sco	ANTARES
74	Sculptor	Scl	α Scl			
75	Scutum	Sct	α Sct	Ioannina		
76	Serpens	Ser	α Ser	Unuk Al Hay		
77	Sextans	Sex	α Sex			
78	Taurus	Tau	α Tau	Aldebaran		
79	Telescopium	Tel	α Tel			
80	Triangulum	Tri	α Tri	Mothallah		
81	Triangulum Australe	TrA	α TrA	Atria		
82	Tucana	Tuc	α Tuc			
83	Ursa Major	UMa	α UMa	Dubhe	80 UMa	ALCOR
84	Ursa Minor	UMi	α UMi	Polaris	α UMi	POLARIS
85	Vela	Vel	α Vel		γ Vel	REGOR
86	Virgo	Vir	α Vir	Spica, Azimech		
87	Volans	Vol	α Vol			
88	Vulpecula	Vul	α Vul	Anser, Lucida		

## Brightest Stars

Star Names in CAPITAL LETTERS are on the Cube

Rank	International Astronomical Union (IAU) Star Name	Traditional Star Name	NAME on the Cube
0		Sun	
1	$\alpha$ CMa	Sirius	SIRIUS
2	$\alpha$ Car	Canopus,	CANOPUS
3	$\alpha$ Boo	Arcturus	ARCTURUS
4	$\alpha_1$ Cen	Alpha Centauri A	
5	$\alpha$ Lyr	Vega	
6	$\beta$ Ori	Rigel	RIGEL
7	$\alpha$ CMi	Procyon	PROCYON
8	$\alpha$ Eri	Achernar	
9	$\alpha$ Ori	Betelgeuse	
10	$\beta$ Cen	Hadar (Agena)	
11	$\alpha_1$ Aur	Capella A	
12	$\alpha$ Aql	Altair	ALTAIR
13	$\alpha$ Tau	Aldebaran	
14	$\alpha_2$ Aur	Capella B	
15	$\alpha$ Vir	Spica	
16	$\alpha$ Sco	Antares	ANTARES
17	$\beta$ Gem	Pollux	POLLUX
18	$\alpha$ PsA	Fomalhaut	
19	$\alpha$ Cyg	Deneb	
20	$\beta$ Cru	Mimosa	
21	$\alpha_2$ Cen	Alpha Centauri B	
22	$\alpha$ Leo	Regulus	REGULUS
23	$\alpha_1$ Cru	Acrux A	
24	$\epsilon$ CMa	Adara	
25	$\lambda$ Sco	Shaula	
26	$\gamma$ Cru	Gacrux	
27	$\gamma$ Ori	Bellatrix	
28	$\beta$ Tau	El Nath	
29	$\beta$ Car	Miaplacidus	
30	$\epsilon$ Ori	Alnilam	
31	$\zeta_1$ Ori	Alnitak A	
32	$\alpha$ Gru	Al Na'ir	ALNAIR
33	$\epsilon$ UMa	Alioth	
34	$\gamma_1$ Vel	Gamma Velorum A	
35	$\epsilon$ Sgr	Kaus Australis	
36	$\alpha$ Per	Mirfak	
37	$\delta$ CMa	Wezen	
38	$\eta$ UMa	Benetnasch (Alkaid)	
39	$\theta$ Sco	Sargas	
40	$\alpha_1$ UMa	Dubhe A	
41	$\gamma$ Gem	Alhena	
42	$\alpha$ Pav	Peacock	
43	$\alpha$ TrA	Atria	
44	$\alpha_1$ Gem	Castor A	
45	$\beta$ CMa	Murzim	
46	$\alpha$ Hya	Alphard	
47	$\alpha$ Ari	Hamal	
48	$\alpha$ UMi	Polaris	POLARIS
49	$\delta_1$ Vel	Delta Velorum A	
50	$\beta$ Cet	Deneb Kaitos	
51	$\kappa$ Ori	Saiph	
52	$\sigma$ Sgr	Nunki	
53	$\theta$ Cen	Menkent	
54	$\alpha$ And	Alpheratz	
55	$\beta$ And	Mirach	
56	$\beta$ UMi	Kochab	

57	$\alpha_2$ Cru	Acrux B	
58	$\alpha$ Oph	Ras Alhague	
59	$\beta$ Per	Algol	ALGOL
60	$\beta$ Gru	Beta Gruis	
61	$\beta$ Leo	Denebola	
62	$\zeta$ Pup	Naos	
63	$\lambda$ Vel	Lambda Velorum	
64	$\gamma$ Dra	Etamin	
65	$\alpha_1$ CrB	Gemma A / Alphecca A	
66	$\gamma$ Cyg	Sadr	
67	$\alpha$ Cas	Schedar	
68	$\iota$ Car	Aspidiske	
69	$\gamma_1$ And	Almach A	
70	$\zeta_1$ UMa	Mizar A	
71	$\beta$ Cas	Caph	
72	$\epsilon$ Cen	Epsilon Centauri	
73	$\gamma_1$ Leo	Algieba A	
74	$\alpha$ Lup	Alpha Lupi	
75	$\delta$ Sco	Dschubba	
76	$\epsilon$ Sco	Wei	
77	$\eta$ Cen	Eta Centauri	
78	$\beta$ UMa	Merak	
79	$\alpha$ Phe	Ankaa	
80	$\kappa$ Sco	Girtab	
81	$\gamma$ Cas	Gamma Cassiopeiae	
82	$\epsilon$ Peg	Enif	
83	$\eta$ CMa	Aludra	
84	$\epsilon_1$ Car	Avior A	
85	$\beta$ Peg	Scheat	
86	$\gamma$ UMa	Phecda	
87	$\alpha$ Cep	Alderamin	
88	$\kappa$ Vel	Kappa Velorum	
89	$\alpha$ Peg	Markab	
90	$\epsilon$ Cyg	Gienah	

## Abbreviated Constellation Names

Abbreviated Three-Letter Constellation Names in CAPITAL LETTERS are on the Cube

#	Constellation	Abbreviated Name	NAME on the Cube
1	Andromeda	And	
2	Antlia	Ant	ANT
3	Apus	Aps	APS
4	Aquarius	Aqr	
5	Aquila	Aql	
6	Ara	Ara	
7	Aries	Ari	ARI
8	Auriga	Aur	AUR
9	Boötes	Boo	
10	Caelum	Cae	
11	Camelopardalis	Cam	
12	Cancer	Cnc	CNC
13	Canes Venatici	CVn	
14	Canis Major	CMA	
15	Canis Minor	CMi	
16	Capricornus	Cap	
17	Carina	Car	CAR
18	Cassiopeia	Cas	
19	Centaurus	Cen	CEN
20	Cepheus	Cep	
21	Cetus	Cet	CET
22	Chamaeleon	Cha	
23	Circinus	Cir	CIR
24	Columba	Col	COL
25	Coma Berenices	Com	
26	Corona Australis	CrA	
27	Corona Borealis	CrB	
28	Corvus	Crv	
29	Crater	Crt	CRT
30	Crux	Cru	CRU
31	Cygnus	Cyg	
32	Delphinus	Del	
33	Dorado	Dor	
34	Draco	Dra	
35	Equuleus	Equ	
36	Eridanus	Eri	
37	Fornax	For	
38	Gemini	Gem	
39	Grus	Gru	
40	Hercules	Her	
41	Horologium	Hor	
42	Hydra	Hya	
43	Hydrus	Hyi	
44	Indus	Ind	
45	Lacerta	Lac	
46	Leo	Leo	
46	Leo	Leo	
47	Leo Minor	LMi	
48	Lepus	Lep	
49	Libra	Lib	
50	Lupus	Lup	
51	Lynx	Lyn	
52	Lyra	Lyr	LYR
53	Mensa	Men	
54	Microscopium	Mic	
55	Monoceros	Mon	
56	Musca	Mus	



57	Norma	Nor	
58	Octans	Oct	
59	Ophiuchus	Oph	
60	Orion	Ori	ORI
61	Pavo	Pav	
62	Pegasus	Peg	PEG
63	Perseus	Per	PER
64	Phoenix	Phe	
65	Pictor	Pic	PIC
66	Pisces	Psc	
67	Piscis Austrinus	PsA	
68	Puppis	Pup	
69	Pyxis	Pyx	
70	Reticulum	Ret	RET
71	Sagitta	Sge	
72	Sagittarius	Sgr	
73	Scorpius	Sco	
74	Sculptor	Scl	
75	Scutum	Sct	
76	Serpens	Ser	SER
77	Sextans	Sex	
78	Taurus	Tau	
79	Telescopium	Tel	
80	Triangulum	Tri	TRI
81	Triangulum Australe	TrA	
82	Tucana	Tuc	
83	Ursa Major	UMa	
84	Ursa Minor	UMi	
85	Vela	Vel	
86	Virgo	Vir	
87	Volans	Vol	
88	Vulpecula	Vul	

# Constellation & Star Names Cube Design

## Cube Layout

In this *particular* design, all the preceding Names written in CAPITAL LETTERS can be displayed on a Cube.

After many attempts, the best layout that I have designed is as follows:

- 1- There should be *much less* letters on the Bottom Layer than on the Middle and Top Layers
- 2- There should be a *maximum* of 1 blank corner displayed on a solved Face
- 3- There should be a *maximum* of 2 blank edges displayed on a solved Face

By applying these rules, we ensure that a maximum number of names can be displayed on a solved face.

There are Constellation *Selectors* on the Bottom Layer for selecting the *right* combination of Constellation+Star.

## Top Layer Layout



Letters on the Top Layer are sorted out as follows:

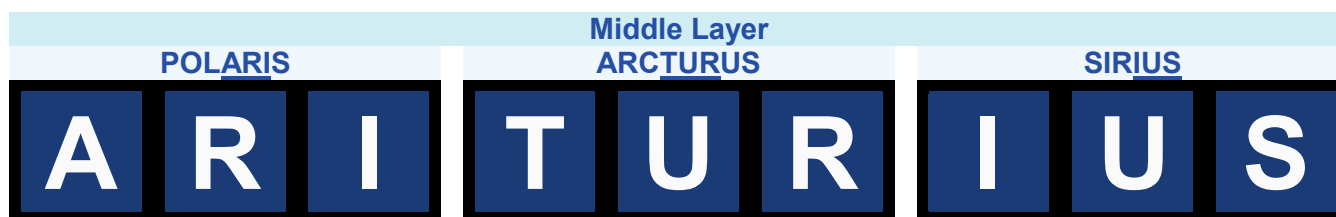
- 1- 5 **T**op **L**eft letters on corner cubes: A, C, P, R, S
- 2- 7 **T**op **C**enter letters on edge cubes: A, E, I, L, N, O, R
- 3- 7 **T**op **R**ight letters on corner cubes: C, G, L, N, O, R, T

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

- 1- 2 **T**op **L**eft corner cubes: (C,P,S), (A,R,L **T**op **R**ight)
- 2- 4 **T**op **C**enter edge cubes: (A,E), (I,L), (N,O), (R,blank **M**iddle **R**ight)
- 3- 2 **T**op **R**ight corner cubes: (C,G,O), (N,R,T)

So, now there are 4 corner and 8 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 **M**iddle **L**eft letters on edge cubes: A, C, E, I, L, O, T, U
- 2- 6 **M**iddle **C**enter letters on center cubes: I, L, P, R, U, Y
- 3- 6 **M**iddle **R**ight letters on edge cubes: E, F, R, S, U, X, blank

Letters are now *logically* combined on edge cubes:

- 1- 4 **M**iddle **L**eft edge cubes: (A,E), (C,I), (L,O), (T,U)
- 2- 3 **M**iddle **R**ight edge cubes: (E,F), (R,S), (U,X)

So, now there are 4 corner and 1 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- 2 **Bottom Left** letters on 1 corner cube: S, U, blank
- 2- 1 **Bottom Center** letter on 1 edge cube: S, blank
- 3- 9 **Bottom Right** groups of letters on 3 corner cubes: Aql, Boo, Car, CMa, CMi, Gem, Leo, Sco, UMi

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

- 1- 1 **Bottom Left** corner cube: (S,U,blank)
- 2- 1 **Bottom Center** edge cube: (S,blank)
- 3- 3 **Bottom Right** corner cube: (Aql,Boo,Car), (CMa,CMi,Gem), (Leo,Sco,UMi) – Constellation *Selectors*

**Note 1** – Letter ‘S’ is used **Bottom Right** as a **Star Selector** when a star name is displayed *without* utilizing a Constellation Selector. This is used to show that the displayed name is simply a **Star** name. As this Letter ‘S’ is the **Top Left** 180° rotated ‘S’, it should be redrawn.

**Note 2** – Selector ‘Sco’ is used either to select the **Scorpion** constellation or as a **Selector for Some Selected** abbreviated three-letter **constellation** names. In the latter case, there should be *two* abbreviated constellation names displayed together on a solved face.

Letters Layout Table		
Reading from Left to Right		
Additional Letters Included (Some may have to be redrawn)		
<b>Top Left</b> – Corner cubes	<b>Top Center</b> – Edge cubes	<b>Top Right</b> – Corner cubes
A, C, P, R, S	A, E, I, L, N, O, R	C, G, L, N, O, R, T
Z	S, —	S
<b>Middle Left</b> – Edge cubes	<b>Middle Center</b> – Center cubes	<b>Middle Right</b> – Edge cubes
A, C, E, I, L, O, T, U	I, L, P, R, U, Y	E, F, R, S, U, X, <b>blank</b>
S, X, Z, —	—	I, O, Z, —
<b>Bottom Left</b> – Corner cube	<b>Bottom Center</b> – Edge cube	<b>Bottom Right</b> – Corner cube
S, U, blank	S, blank	Aql, Boo, Car, CMa, CMi, Gem, Leo, Sco, UMi
N, O	I, N, O, —	S, Z
Letters in <b>red</b> are 180° rotated		Letters in <b>blue</b> are 90° rotated
Letters Orientation – Recap		
<b>Top Left</b> – Corner cubes	<b>Top Center</b> – Edge cubes	<b>Top Right</b> – Corner cubes
A, C, P, R, S	A, E, I, L, N, O, R	C, G, L, N, O, R, T
<b>Middle Left</b> – Edge cubes	<b>Middle Center</b> – Center cubes	<b>Middle Right</b> – Edge cubes
A, C, E, I, L, O, T, U	I, L, P, R, U, Y	E, F, R, S, U, X, <b>blank</b>
<b>Bottom Left</b> – Corner cube	<b>Bottom Center</b> – Edge cube	<b>Bottom Right</b> – Corner cube
S, U, blank	S, blank	Aql, Boo, Car, CMa, CMi, Gem, Leo, Sco, UMi

Constellation & Star Names

A	L	T
A	I	R
		Aql

A	N	T
A	R	E
S		Sco

A	R	C
T	U	R
U	S	Boo

C	A	N
O	P	U
S		Car

P	O	L
A	R	I
S		UMi

P	O	L
L	U	X
		Gem

P	R	O
C	Y	O
N		CMi

R	E	G
U	L	U
S		Leo

S	I	R
I	U	S
		CMa







Additional Star Names

A	L	C
O	R	
		S

A	L	G
O	L	
		S

A	L	N
A	I	R
		S

A	L	R
A	I	
		S

A	L	T
A	I	S
		S

A	L	T
A	R	F
		S

A	L	T
E	R	F
		S

R	E	G
O	R	
		S

R	I	G
E	L	
		S

R	I	G
I	L	
		S






Abbreviated three-letter Constellation Names

A	N	T
A	P	S
		Sco

A	N	T
A	R	I
		Sco

A	N	T
A	U	R
		Sco

C	N	C
A	U	R
		Sco

C	A	R
A	U	R
		Sco

C	E	N
A	U	R
		Sco

C	E	T
A	U	R
		Sco

C	I	R
A	U	R
		Sco

C	O	L
C	I	R
		Sco

C	R	T
C	I	R
		Sco

C	R	T
C	R	U
		Sco

C	R	T
L	Y	R
		Sco

C	R	T
O	R	I
		Sco

P	E	G
O	R	I
		Sco

P	E	R
O	R	I
		Sco

Abbreviated Three-Letter Constellation Names (Cont'd)

P	I	C
O	R	I
		Sco

R	E	T
O	R	I
		Sco

S	E	R
O	R	I
		Sco

S	E	R
T	R	I
		Sco












Some Interesting Letters Combinations ('S': Special, 'Sco': Special combination)

A	L	G
O	R	E
		S

A	S	T
E	R	
		S

A	S	T
E	R	S
		S

A	S	T
E	R	I
O	N	



A	S	T
A	R	S
		Sco

S	O	L
A	R	S
U	N	Sco

S	O	L
A	R	I
S		Sco

	S	T
A	R	S
U	N	Sco

S	S	S
U	U	U
N	N	Sco

A	S	T
E	R	I
S		Sco

S	O	L
S	Y	S
		Sco





# Solving a Constellation & Star Names Cube Step by Step

In this example, a step by step solving process is applied to the Constellation & Star Names Cube, just described before. Note that we only need to solve a *single* Face out of six. We will solve a Face for  $\alpha$  UMi POLARIS.

**Solve the Cross First**


Standard Rubik's Cube Solving

**Then Solve the Corner Cubes**


Standard Rubik's Cube Solving

**Step 1**

	R	

Center **R** on Front Face

**Step 2**

	O	
	R	

Top Layer: Edge Cube **O**

**Step 3**

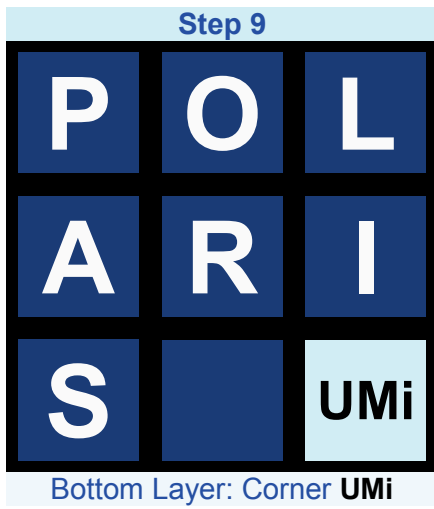
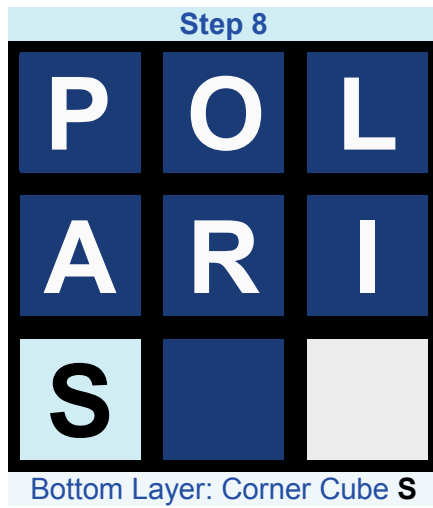
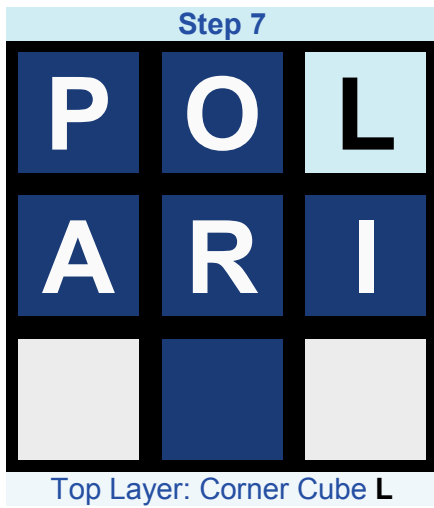
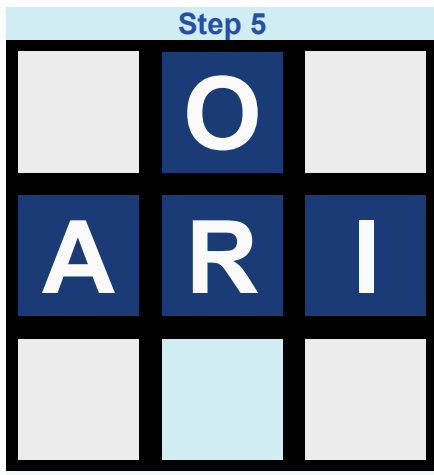
	O	
A	R	

Middle Layer: Edge Cube **A**

**Step 4**

	O	
A	R	I

Middle Layer: Edge Cube **I**

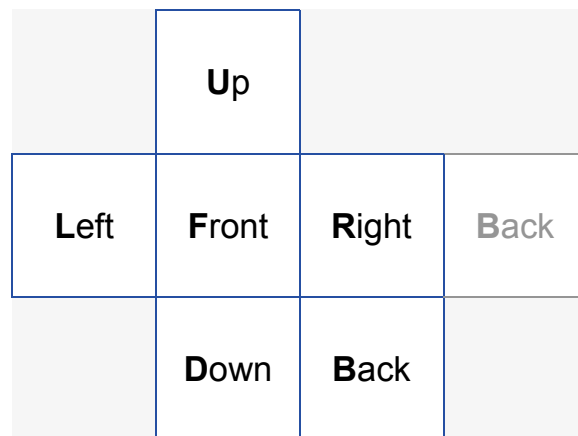
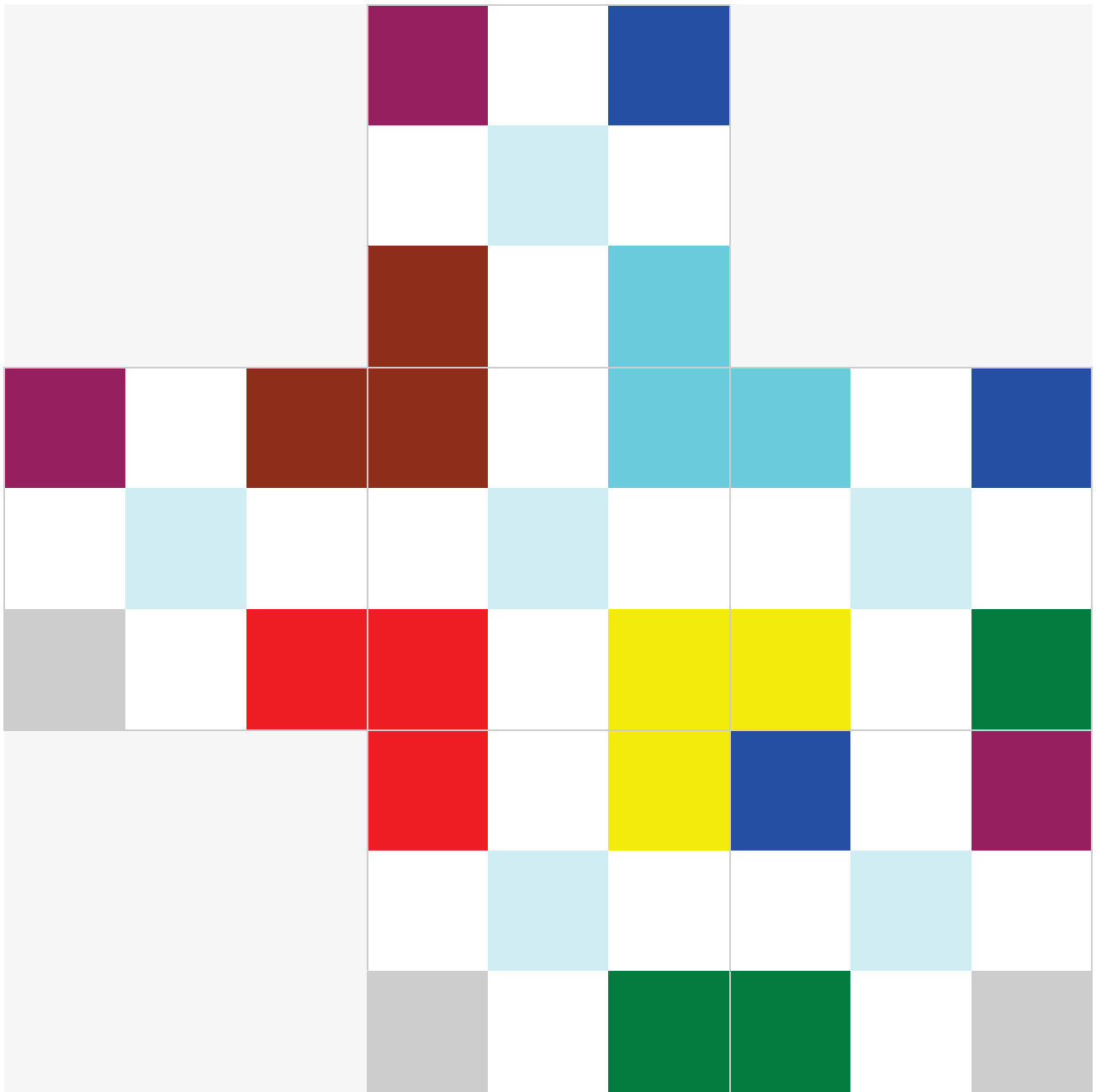


Print out this page and fill in the blank faces with *your* data. Then try to design your own Cube.

<b>TL</b>	<b>TC</b>	<b>TR</b>						
<b>ML</b>	<b>MC</b>	<b>MR</b>						
<b>BL</b>	<b>BC</b>	<b>BR</b>						

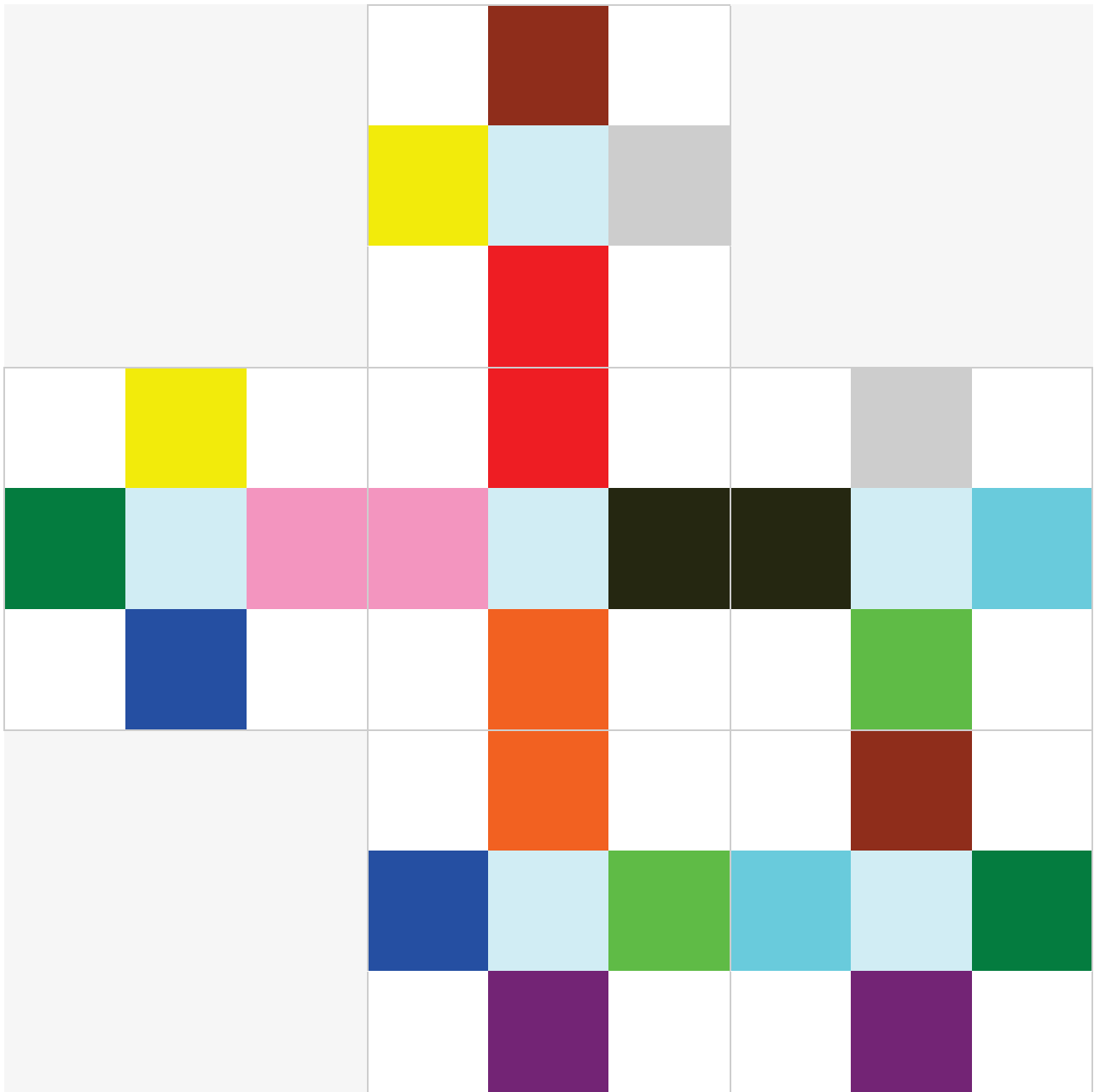
## Corner Cubes Final Check

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.

