

Traditional Chinese Calendar Cube Design

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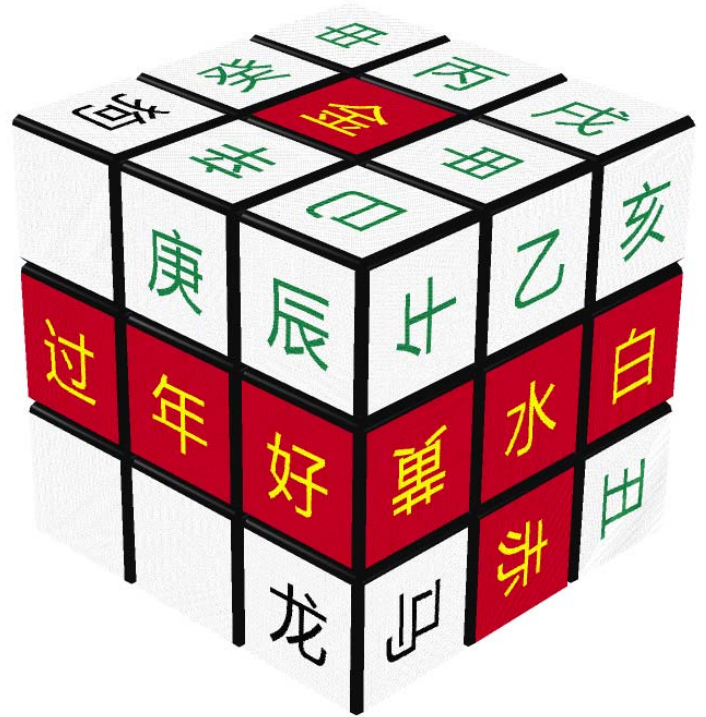
| | | |
|-----------|---|---|
| Designers | André Boulouard | Walter Randelshofer |
| WebSites | http://www.mementoslangues.fr/ | http://www.randelshofer.ch/ |

Introduction

A **Traditional Chinese Calendar Cube** is a 3x3x3 **Rubik's Cube** used to display a Traditional Chinese Calendar. A Calendar can be *Perpetual* (with no year displayed) or *Yearly* (with years displayed). Simplified or traditional chinese characters can be used.

Perpetual Traditional Calendar Cube (Simplified Characters) – Initial State: Year 2000 (Metal Dragon)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 母 | 丙 | 戌 | | | | | | |
| 金 | 金 | 丑 | | | | | | |
| 狗 | 去 | 巳 | | | | | | |
| 庚 | 壬 | 鸡 | 庚 | 辰 | 丑 | 乙 | 亥 | |
| 阴 | 土 | 猴 | 过 | 年 | 好 | 算 | 水 | 白 |
| 猪 | 牛 | 羊 | | 龙 | 巳 | 申 | 田 | |
| 猴 | 兔 | 鼠 | 丁 | 酉 | | | | |
| 虎 | 火 | 青 | 雷 | 木 | 田 | | | |
| 戊 | 巳 | 卯 | 巳 | 鼠 | | | | |



Perpetual Traditional Chinese Calendar Cube Texture

Perpetual Traditional Chinese Calendar Cube

Yearly Traditional Calendar Cube (Simplified Characters) – Initial State: Year 2000 (Metal Dragon)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 母 | 丙 | 戌 | | | | | | |
| 金 | 1 | 丑 | | | | | | |
| 狗 | 去 | 巳 | | | | | | |
| 庚 | 壬 | 鸡 | 庚 | 辰 | 丑 | 乙 | 亥 | |
| 2 | 6 | 1 | 0 | 0 | 年 | 7 | 2 | 5 |
| 猪 | 牛 | 羊 | | 龙 | 巳 | 申 | 田 | |
| 猴 | 兔 | 鼠 | 丁 | 酉 | | | | |
| 虎 | 4 | 4 | 8 | 3 | 3 | | | |
| 戊 | 巳 | 卯 | 巳 | 鼠 | | | | |



Yearly Traditional Chinese Calendar Cube Texture

Yearly Traditional Chinese Calendar Cube

Perpetual Traditional Calendar Cube (Traditional Characters) – Initial State: Year 2000 (Metal Dragon)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 母 | 丙 | 戌 | | | | | | |
| 亥 | 金 | 丑 | | | | | | |
| 狗 | 去 | 巳 | | | | | | |
| 庚 | 辰 | 巳 | 乙 | 亥 | | | | |
| 陰 | 土 | 巽 | 過 | 年 | 好 | 算 | 水 | 白 |
| 龍 | 牛 | 羊 | 龍 | 調 | 紫 | 田 | | |
| 猴 | 兔 | 鼠 | 午 | 丁 | 酉 | | | |
| 虎 | 火 | 青 | 雷 | 木 | 雷 | | | |
| 戊 | 申 | 辰 | 巳 | 鼠 | | | | |



Perpetual Traditional Chinese Calendar Cube Texture

Perpetual Traditional Chinese Calendar Cube

Yearly Traditional Calendar Cube (Traditional Characters) – Initial State: Year 2000 (Metal Dragon)

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 母 | 丙 | 戌 | | | | | | |
| 亥 | 1 | 丑 | | | | | | |
| 狗 | 去 | 巳 | | | | | | |
| 庚 | 辰 | 巳 | 乙 | 亥 | | | | |
| 2 | 6 | 1 | 0 | 0 | 年 | 7 | 2 | 5 |
| 龍 | 牛 | 羊 | 龍 | 調 | 田 | | | |
| 猴 | 兔 | 鼠 | 午 | 丁 | 酉 | | | |
| 虎 | 4 | 4 | 8 | 3 | 3 | | | |
| 戊 | 申 | 辰 | 巳 | 鼠 | | | | |



Yearly Traditional Chinese Calendar Cube Texture

Yearly Traditional Chinese Calendar Cube

Download **CubeTwister** from: <http://www.randelshofer.ch/>

Traditional Chinese Calendar – Useful Links

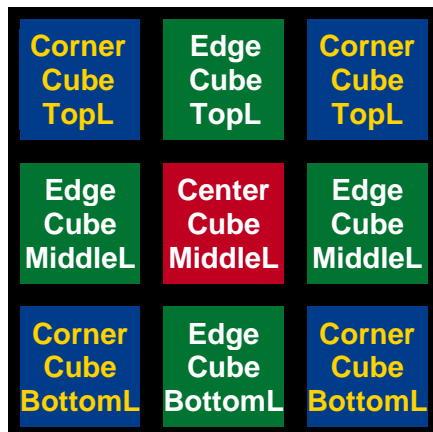
| | |
|---|---|
| http://en.wikipedia.org/wiki/Chinese_calendar | http://en.wikipedia.org/wiki/Chinese_New_Year |
| http://en.wikipedia.org/wiki/Heavenly_stem | http://en.wikipedia.org/wiki/Earthly_branch |
| http://en.wikipedia.org/wiki/Sexagesimal_cycle | http://en.wikipedia.org/wiki/Chinese_astrology |
| http://en.wikipedia.org/wiki/Yin_and_yang | http://en.wikipedia.org/wiki/Feng_shui |
| http://www.friesian.com/elements.htm | http://www.math.nus.edu.sg/aslaksen/calendar/cal.pdf |
| http://en.wikipedia.org/wiki/Five_elements_(Chinese_philosophy) | |

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 Traditional Chinese Calendar is designed by placing characters and numbers on a texture which is then laid down on a Virtual Cube (see <http://www.randelshofer.ch/> for more details).

Designing a Traditional Chinese Calendar 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.

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 |

Traditional Chinese Calendar (夏历 xiàlì)

| Stem | Pīnyīn | Yīn/Yáng | Element | Color | Branch | Pīnyīn | Yīn/Yáng | Animal | Year | Pīnyīn | Rang | Cycle #77 | Cycle #78 | Chinese Year |
|------|--------|----------|---------|--------|--------|--------|----------|---------|------|----------|------|-----------|-----------|---------------|
| 甲 | jiǎ | Yáng | Wood | Green | 子 | zǐ | Yáng | Rat | 甲子 | jiǎzǐ | 1 | 1924 | 1984 | Wood Rat |
| 乙 | yǐ | Yīn | Wood | Green | 丑 | chǒu | Yīn | Ox | 乙丑 | yǐchǒu | 2 | 1925 | 1985 | Wood Ox |
| 丙 | bǐng | Yáng | Fire | Red | 寅 | yín | Yáng | Tiger | 丙寅 | bǐngyín | 3 | 1926 | 1986 | Fire Tiger |
| 丁 | dīng | Yīn | Fire | Red | 卯 | mǎo | Yīn | Rabbit | 丁卯 | dīngmǎo | 4 | 1927 | 1987 | Fire Rabbit |
| 戊 | wù | Yáng | Earth | Yellow | 辰 | chén | Yáng | Dragon | 戊辰 | wùchén | 5 | 1928 | 1988 | Earth Dragon |
| 己 | jǐ | Yīn | Earth | Yellow | 巳 | sì | Yīn | Snake | 己巳 | jǐsì | 6 | 1929 | 1989 | Earth Snake |
| 庚 | gēng | Yáng | Metal | White | 午 | wǔ | Yáng | Horse | 庚午 | gēngwǔ | 7 | 1930 | 1990 | Metal Horse |
| 辛 | xīn | Yīn | Metal | White | 未 | wèi | Yīn | Sheep | 辛未 | xīnwèi | 8 | 1931 | 1991 | Metal Horse |
| 壬 | rén | Yáng | Water | Black | 申 | shēn | Yáng | Monkey | 壬申 | rénshēn | 9 | 1932 | 1992 | Water Monkey |
| 癸 | guǐ | Yīn | Water | Black | 酉 | yǒu | Yīn | Rooster | 癸酉 | guǐyǒu | 10 | 1933 | 1993 | Water Rooster |
| 甲 | jiǎ | Yáng | Wood | Green | 戌 | xū | Yáng | Dog | 甲戌 | jiǎxū | 11 | 1934 | 1994 | Wood Dog |
| 乙 | yǐ | Yīn | Wood | Green | 亥 | hài | Yīn | Pig | 乙亥 | yǐhài | 12 | 1935 | 1995 | Wood Pig |
| 丙 | bǐng | Yáng | Fire | Red | 子 | zǐ | Yáng | Rat | 丙子 | bǐngzǐ | 13 | 1936 | 1996 | Fire Rat |
| 丁 | dīng | Yīn | Fire | Red | 丑 | chǒu | Yīn | Ox | 丁丑 | dīngchǒu | 14 | 1937 | 1997 | Fire Ox |
| 戊 | wù | Yáng | Earth | Yellow | 寅 | yín | Yáng | Tiger | 戊寅 | wùyín | 15 | 1938 | 1998 | Earth Tiger |
| 己 | jǐ | Yīn | Earth | Yellow | 卯 | mǎo | Yīn | Rabbit | 己卯 | jǐmǎo | 16 | 1939 | 1999 | Earth Rabbit |
| 庚 | gēng | Yáng | Metal | White | 辰 | chén | Yáng | Dragon | 庚辰 | gēngchén | 17 | 1940 | 2000 | Metal Dragon |
| 辛 | xīn | Yīn | Metal | White | 巳 | sì | Yīn | Snake | 辛巳 | xīnsì | 18 | 1941 | 2001 | Metal Snake |
| 壬 | rén | Yáng | Water | Black | 午 | wǔ | Yáng | Horse | 壬午 | rénwǔ | 19 | 1942 | 2002 | Water Horse |
| 癸 | guǐ | Yīn | Water | Black | 未 | wèi | Yīn | Sheep | 癸未 | guǐwèi | 20 | 1943 | 2003 | Water Sheep |
| 甲 | jiǎ | Yáng | Wood | Green | 申 | shēn | Yáng | Monkey | 甲申 | shēnjiǎ | 21 | 1944 | 2004 | Wood Monkey |

| | | | | | | | | | | | | | | |
|---|------|------|-------|--------|---|------|------|---------|----|----------|----|------|------|--------------|
| 乙 | yǐ | Yīn | Wood | Green | 酉 | yǒu | Yīn | Rooster | 乙酉 | yǐyǒu | 22 | 1945 | 2005 | Wood Rooster |
| 丙 | bǐng | Yáng | Fire | Red | 戌 | xū | Yáng | Dog | 丙戌 | bǐngxū | 23 | 1946 | 2006 | Fire Dog |
| 丁 | dīng | Yīn | Fire | Red | 亥 | hài | Yīn | Pig | 丁亥 | dīnghài | 24 | 1947 | 2007 | Fire Pig |
| 戊 | wù | Yáng | Earth | Yellow | 子 | zǐ | Yáng | Rat | 戊子 | wùzǐ | 25 | 1948 | 2008 | Earth Rat |
| 己 | jǐ | Yīn | Earth | Yellow | 丑 | chǒu | Yīn | Ox | 己丑 | jǐchǒu | 26 | 1949 | 2009 | Earth Ox |
| 庚 | gēng | Yáng | Metal | White | 寅 | yín | Yáng | Tiger | 庚寅 | gēngyín | 27 | 1950 | 2010 | Metal Tiger |
| 辛 | xīn | Yīn | Metal | White | 卯 | mǎo | Yīn | Rabbit | 辛卯 | xīnmǎo | 28 | 1951 | 2011 | Metal Rabbit |
| 壬 | rén | Yáng | Water | Black | 辰 | chén | Yáng | Dragon | 壬辰 | rénchén | 29 | 1952 | 2012 | Water Dragon |
| 癸 | guǐ | Yīn | Water | Black | 巳 | sì | Yīn | Snake | 癸巳 | guǐsì | 30 | 1953 | 2013 | Water Snake |
| 甲 | jiǎ | Yáng | Wood | Green | 午 | wǔ | Yáng | Horse | 甲午 | jiǎwǔ | 31 | 1954 | 2014 | Wood Horse |
| 乙 | yǐ | Yīn | Wood | Green | 未 | wèi | Yīn | Sheep | 乙未 | yǐwèi | 32 | 1955 | 2015 | Wood Sheep |
| 丙 | bǐng | Yáng | Fire | Red | 申 | shēn | Yáng | Monkey | 丙申 | bǐngshēn | 33 | 1956 | 2016 | Fire Monkey |
| 丁 | dīng | Yīn | Fire | Red | 酉 | yǒu | Yīn | Rooster | 丁酉 | dīngyǒu | 34 | 1957 | 2017 | Fire Rooster |
| 戊 | wù | Yáng | Earth | Yellow | 戌 | xū | Yáng | Dog | 戊戌 | wùxū | 35 | 1958 | 2018 | Earth Dog |
| 己 | jǐ | Yīn | Earth | Yellow | 亥 | hài | Yīn | Pig | 己亥 | jǐhài | 36 | 1959 | 2019 | Earth Pig |
| 庚 | gēng | Yáng | Metal | White | 子 | zǐ | Yáng | Rat | 庚子 | gēngzǐ | 37 | 1960 | 2020 | Metal Rat |
| 辛 | xīn | Yīn | Metal | White | 丑 | chǒu | Yīn | Ox | 辛丑 | xīnchǒu | 38 | 1961 | 2021 | Metal Ox |
| 壬 | rén | Yáng | Water | Black | 寅 | yín | Yáng | Tiger | 壬寅 | rényín | 39 | 1962 | 2022 | Water Tiger |
| 癸 | guǐ | Yīn | Water | Black | 卯 | mǎo | Yīn | Rabbit | 癸卯 | guǐmǎo | 40 | 1963 | 2023 | Water Rabbit |
| 甲 | jiǎ | Yáng | Wood | Green | 辰 | chén | Yáng | Dragon | 甲辰 | jiǎchén | 41 | 1964 | 2024 | Wood Dragon |
| 乙 | yǐ | Yīn | Wood | Green | 巳 | sì | Yīn | Snake | 乙巳 | yǐsì | 42 | 1965 | 2025 | Wood Snake |
| 丙 | bǐng | Yáng | Fire | Red | 午 | wǔ | Yáng | Horse | 丙午 | bǐngwǔ | 43 | 1966 | 2026 | Fire Horse |

| | | | | | | | | | | | | | | |
|---|------|------|-------|--------|---|------|------|---------|----|----------|----|------|------|---------------|
| 丁 | dīng | Yīn | Fire | Red | 未 | wèi | Yīn | Sheep | 丁未 | dīngwèi | 44 | 1967 | 2027 | Fire Sheep |
| 戊 | wù | Yáng | Earth | Yellow | 申 | shēn | Yáng | Monkey | 戊申 | wùshēn | 45 | 1968 | 2028 | Earth Monkey |
| 己 | jǐ | Yīn | Earth | Yellow | 酉 | yǒu | Yīn | Rooster | 己酉 | jǐyǒu | 46 | 1969 | 2029 | Earth Rooster |
| 庚 | gēng | Yáng | Metal | White | 戌 | xū | Yáng | Dog | 庚戌 | gēngxū | 47 | 1970 | 2030 | Metal Dog |
| 辛 | xīn | Yīn | Metal | White | 亥 | hài | Yīn | Pig | 辛亥 | xīnhài | 48 | 1971 | 2031 | Metal Pig |
| 壬 | rén | Yáng | Water | Black | 子 | zǐ | Yáng | Rat | 壬子 | rénzǐ | 49 | 1972 | 2032 | Water Rat |
| 癸 | guǐ | Yīn | Water | Black | 丑 | chǒu | Yīn | Ox | 癸丑 | guǐchǒu | 50 | 1973 | 2033 | Water Ox |
| 甲 | jiǎ | Yáng | Wood | Green | 寅 | yín | Yáng | Tiger | 甲寅 | jiǎyín | 51 | 1974 | 2034 | Wood Tiger |
| 乙 | yǐ | Yīn | Wood | Green | 卯 | mǎo | Yīn | Rabbit | 乙卯 | yǐmǎo | 52 | 1975 | 2035 | Wood Rabbit |
| 丙 | bǐng | Yáng | Fire | Red | 辰 | chén | Yáng | Dragon | 丙辰 | bǐngchén | 53 | 1976 | 2036 | Fire Dragon |
| 丁 | dīng | Yīn | Fire | Red | 巳 | sì | Yīn | Snake | 丁巳 | dīngsì | 54 | 1977 | 2037 | Fire Snake |
| 戊 | wù | Yáng | Earth | Yellow | 午 | wǔ | Yáng | Horse | 戊午 | wùwǔ | 55 | 1978 | 2038 | Earth Horse |
| 己 | jǐ | Yīn | Earth | Yellow | 未 | wèi | Yīn | Sheep | 己未 | jǐwèi | 56 | 1979 | 2039 | Earth Sheep |
| 庚 | gēng | Yáng | Metal | White | 申 | shēn | Yáng | Monkey | 庚申 | gēngshēn | 57 | 1980 | 2040 | Metal Monkey |
| 辛 | xīn | Yīn | Metal | White | 酉 | yǒu | Yīn | Rooster | 辛酉 | xīnyǒu | 58 | 1981 | 2041 | Metal Rooster |
| 壬 | rén | Yáng | Water | Black | 戌 | xū | Yáng | Dog | 壬戌 | rénxū | 59 | 1982 | 2042 | Water Dog |
| 癸 | guǐ | Yīn | Water | Black | 亥 | hài | Yīn | Pig | 癸亥 | guǐhài | 60 | 1983 | 2043 | Water Pig |

Chinese New Year



过年好！

Guònián hǎo !

Happy New Year !

新年快乐！

Xīnnián kuàilè !

The Ten Heavenly Stems (天干 tiāngān)

| Seq. | Heavenly Stem | Pīnyīn (拼音) | Yīnyáng (阴阳) | Element | Color |
|------|---------------|-------------|--------------|---------|--------|
| 1 | 甲 | jiǎ | Yáng | Wood | Green |
| 2 | 乙 | yǐ | Yīn | | |
| 3 | 丙 | bǐng | Yáng | Fire | Red |
| 4 | 丁 | dīng | Yīn | | |
| 5 | 戊 | wù | Yáng | Earth | Yellow |
| 6 | 己 | jǐ | Yīn | | |
| 7 | 庚 | gēng | Yáng | Metal | White |
| 8 | 辛 | xīn | Yīn | | |
| 9 | 壬 | rén | Yáng | Water | Black |
| 10 | 癸 | guǐ | Yīn | | |

The Twelve Earthly Branches (地支 dìzhī)

| Seq. | Chinese | English | Earthly Branch |
|------|------------|---------|----------------|
| 1 | 鼠 shǔ | Rat | 子 zǐ (Yáng) |
| 2 | 牛 niú | Ox | 丑 chǒu (Yīn) |
| 3 | 虎 hǔ | Tiger | 寅 yín (Yáng) |
| 4 | 兔 tù | Rabbit | 卯 mǎo (Yīn) |
| 5 | 龍 lóng (龙) | Dragon | 辰 chén (Yáng) |
| 6 | 蛇 shé | Snake | 巳 sì (Yīn) |
| 7 | 馬 mǎ (马) | Horse | 午 wǔ (Yáng) |
| 8 | 羊 yáng | Sheep | 未 wèi (Yīn) |
| 9 | 猴 hóu | Monkey | 申 shēn (Yáng) |
| 10 | 鷄 jī (鸡) | Rooster | 酉 yǒu (Yīn) |
| 11 | 狗 gǒu | Dog | 戌 xū (Yáng) |
| 12 | 豬 zhū (猪) | Pig | 亥 hài (Yīn) |

Happy New Year – 过年好 Guònián Hǎo

| Year | New Year Date | Stem | | Branch | | Chinese Zodiac Sign | | |
|------|---------------|------|------|--------|------|---------------------|------|---------|
| 2008 | February 7 | 戊 | wù | 子 | zǐ | 鼠 | shǔ | Rat |
| 2009 | January 26 | 己 | jǐ | 丑 | chǒu | 牛 | niú | Ox |
| 2010 | February 14 | 庚 | gēng | 寅 | yín | 虎 | hǔ | Tiger |
| 2011 | February 3 | 辛 | xīn | 卯 | mǎo | 兔 | tù | Rabbit |
| 2012 | January 23 | 壬 | rén | 辰 | chén | 龙/龍 | lóng | Dragon |
| 2013 | February 10 | 癸 | guǐ | 巳 | sì | 蛇 | shé | Snake |
| 2014 | January 31 | 甲 | jiǎ | 午 | wǔ | 马/馬 | mǎ | Horse |
| 2015 | February 19 | 乙 | xīn | 未 | wèi | 羊 | yáng | Sheep |
| 2016 | February 8 | 丙 | bǐng | 申 | shēn | 猴 | hóu | Monkey |
| 2017 | January 28 | 丁 | dīng | 酉 | yǒu | 鸡/鷄 | jī | Rooster |
| 2018 | February 16 | 戊 | wù | 戌 | xū | 狗 | gǒu | Dog |
| 2019 | February 5 | 己 | jǐ | 亥 | hài | 猪/豬 | zhū | Pig |

Traditional Chinese Hours of the Day – 時辰 *shíchén* (2 Hours Marking Unit)

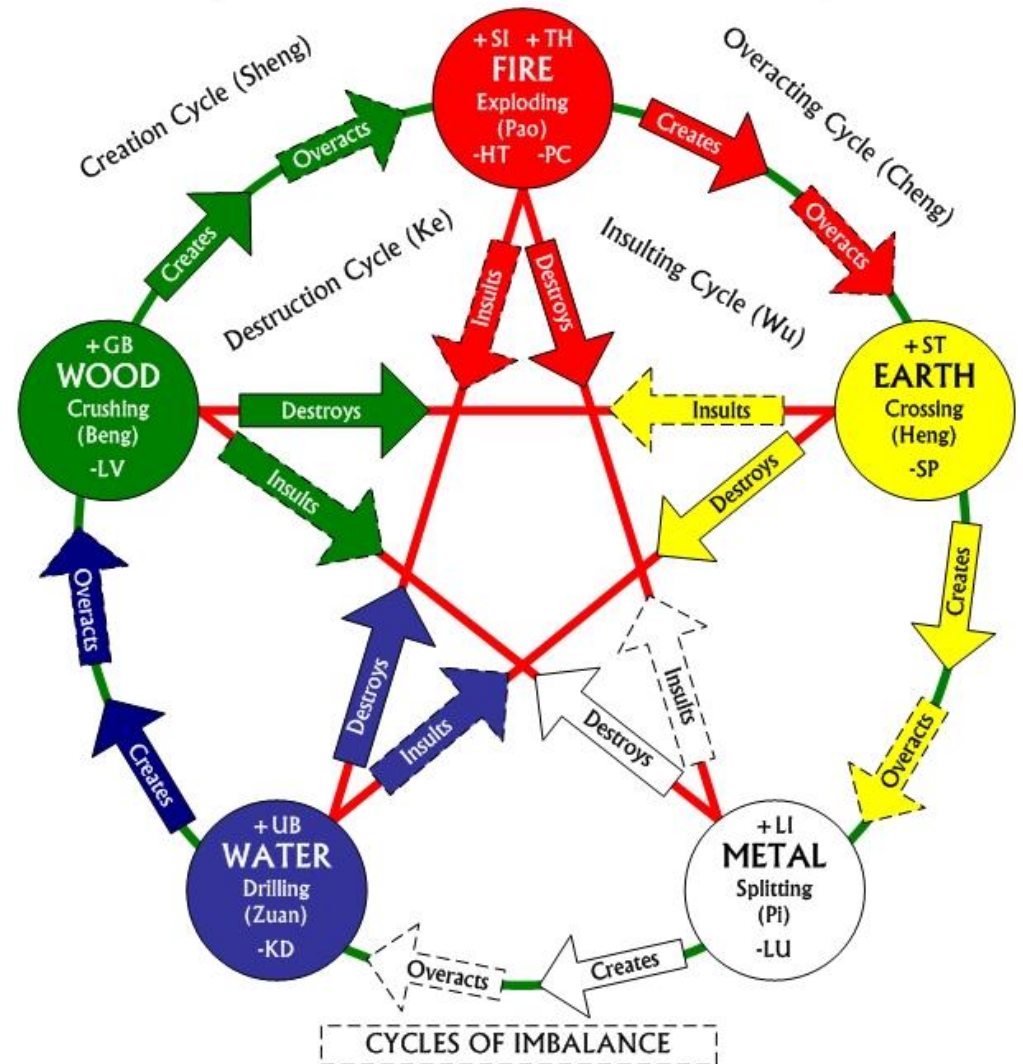
| | | | | | |
|----|-------------------------|---------------|----|----------------|---------|
| 1 | 11:00 p.m. - 01:00 a.m. | 23:00 - 01:00 | 子時 | <i>zǐshí</i> | Rat |
| 2 | 01:00 a.m. - 03:00 a.m. | 01:00 - 03:00 | 丑時 | <i>chǒushí</i> | Ox |
| 3 | 03:00 a.m. - 05:00 a.m. | 03:00 - 05:00 | 寅時 | <i>yínshí</i> | Tiger |
| 4 | 05:00 a.m. - 07:00 a.m. | 05:00 - 07:00 | 卯時 | <i>mǎoshí</i> | Rabbit |
| 5 | 07:00 a.m. - 09:00 a.m. | 07:00 - 09:00 | 辰時 | <i>chénshí</i> | Dragon |
| 6 | 09:00 a.m. - 11:00 a.m. | 09:00 - 11:00 | 巳時 | <i>sìshí</i> | Snake |
| 7 | 11:00 a.m. - 01:00 p.m. | 11:00 - 13:00 | 午時 | <i>wǔshí</i> | Horse |
| 8 | 01:00 p.m. - 03:00 p.m. | 13:00 - 15:00 | 未時 | <i>wèishí</i> | Sheep |
| 9 | 03:00 p.m. - 05:00 p.m. | 15:00 - 17:00 | 申時 | <i>shēnshí</i> | Monkey |
| 10 | 05:00 p.m. - 07:00 p.m. | 17:00 - 19:00 | 酉時 | <i>yǒushí</i> | Rooster |
| 11 | 07:00 p.m. - 09:00 p.m. | 19:00 - 21:00 | 戌時 | <i>xūshí</i> | Dog |
| 12 | 09:00 p.m. - 11:00 a.m. | 21:00 - 23:00 | 亥時 | <i>hàishí</i> | Pig |

Chinese Time Frame of the Day

| | | |
|--------------------------|-------|------------------------|
| Midnight – Dawn | 凌晨 | <i>língchén</i> |
| Dawn – 9:00/10:00 | 早上 | <i>zǎoshàng</i> |
| 9:00/10:00 – Midday/Noon | 上午 | <i>shàngwǔ</i> |
| Midday/Noon – 12:59 | 正午/中午 | <i>zhèngwǔ/zhōngwǔ</i> |
| 13:00 – Dusk | 下午 | <i>xiàwǔ</i> |
| Dusk – 20:00/21:00 | 傍晚 | <i>bàngwǎn</i> |
| 20:00/21:00 – Midnight | 晚上 | <i>wǎnshàng</i> |

FIVE ELEMENTS

CYCLES OF GENERATION AND CONTROL



The 5 Chinese Elements & Their Associations

| | Wood | Fire | Earth | Metal | Water |
|-----------------------------|---------------------|----------------------|-----------------------|-----------------------|----------------------|
| Element | 木 | 火 | 土 | 金 | 水 |
| | <i>mù</i> | <i>huǒ</i> | <i>tǔ</i> | <i>jīn</i> | <i>shuǐ</i> |
| Color | Blue/Green | Red | Yellow | White | Black |
| | 青 | 赤 | 黄 | 白 | 黑 |
| | <i>qīng</i> | <i>chì</i> | <i>huáng</i> | <i>bái</i> | <i>hēi</i> |
| Symbol | Dragon | Phoenix | Cauldron | Tiger | Turtle |
| | 龙 | 凤 | 大锅 | 虎 | 龟 |
| | <i>lóng</i> | <i>fèng</i> | <i>dà guō</i> | <i>hǔ</i> | <i>guī</i> |
| Season | Spring | Summer | Between | Autumn | Winter |
| Month | 1-2 | 4-5 | 3,6,9,12 | 7-8 | 10-11 |
| Direction | East | South | Center | West | North |
| Weather Condition | Rain | Heat | Wind | Clear | Cold |
| | 雨 | 燠 | 风 | 阳 | 寒 |
| | <i>yǔ</i> | <i>yù</i> | <i>fēng</i> | <i>yáng</i> | <i>hán</i> |
| Mutually Generating | Wood generates Fire | Fire generates Earth | Earth generates Metal | Metal generates Water | Water generates Wood |
| 相生 | | | | | |
| <i>Xiāngshēng</i> | | | | | |
| Mutually Controlling | Wood controls Earth | Fire controls Metal | Earth controls Water | Metal controls Wood | Water controls Fire |
| 相克 | | | | | |
| <i>Xiāngkè</i> | | | | | |
| People | Mongol | Chinese | Manchu | Tibetan | Muslims |
| | 蒙 | 汉 | 满 | 藏 | 回 |
| | <i>Měng</i> | <i>Hàn</i> | <i>Mǎn</i> | <i>Zàng</i> | <i>Huí</i> |
| Planet | Jupiter | Mars | Saturn | Venus | Mercury |
| | 木星 | 火星 | 土星 | 金星 | 水星 |
| | <i>Mùxīng</i> | <i>Huǒxīng</i> | <i>Tǔxīng</i> | <i>Jīnxīng</i> | <i>Shuǐxīng</i> |
| Day | Thursday | Tuesday | Saturday | Friday | Wednesday |

| | | | | | |
|---------------|-------------|-----------|------------|---------------|------------|
| Animal | Scaled | Winged | Naked | Furred | Shelled |
| Action | Countenance | Sight | Thought | Speech | Listening |
| Sense | Sight | Taste | Touch | Smell | Hearing |
| Sound | Calling | Laughing | Singing | Lamenting | Moaning |
| Taste | Sour | Bitter | Sweet | Acrid/Spicy | Salty |
| Smell | Goatish | Burning | Fragrant | Rank | Rotten |
| Organ | Liver | Heart | Spleen | Lung | Kidney |
| Virtue | Benevolence | Propriety | Good Faith | Righteousness | Knowledge |
| | 仁 | 禮 | 信 | 义 | 知 |
| | <i>rén</i> | <i>lǐ</i> | <i>xìn</i> | <i>yì</i> | <i>zhī</i> |

Chinese Character Tables

Stems, Elements, Colors, Branches and Animals are counted beginning from Year **2000** (Metal Dragon Year). Simplified chinese characters are in red. Traditional chinese characters are in blue. Differences are highlighted.

| Chinese Character Table 1 – Stem, Yin/Yáng, Element, Color | | | | | | | | | | | | | | | | |
|--|---|---|------|----------|---|------|---------|---|---|------|-------|----|----|---|-------|------------|
| Stem | | | | Yin/Yáng | | | Element | | | | Color | | | | | |
| S5 | 甲 | 甲 | jiǎ | 阳 | 陽 | Yáng | E3 | 木 | 木 | mù | Wood | C3 | 青 | 青 | qīng | Green Blue |
| S6 | 乙 | 乙 | yǐ | 阴 | 陰 | Yīn | | 火 | 火 | huǒ | Fire | | C4 | 赤 | 赤 | chì |
| S7 | 丙 | 丙 | bǐng | 阳 | 陽 | Yáng | E4 | 土 | 土 | tǔ | Earth | C5 | 黄 | 黃 | huáng | Yellow |
| S8 | 丁 | 丁 | dīng | 阴 | 陰 | Yīn | | 金 | 金 | jīn | Metal | | C1 | 白 | 白 | bái |
| S9 | 戊 | 戊 | wù | 阳 | 陽 | Yáng | E5 | 水 | 水 | shuǐ | Water | C2 | 黑 | 黑 | hēi | Black |
| S10 | 己 | 己 | jǐ | 阴 | 陰 | Yīn | | 庚 | 庚 | gēng | Yáng | | S1 | 辛 | 辛 | xīn |
| S1 | 庚 | 庚 | gēng | 阳 | 陽 | Yáng | E1 | 壬 | 壬 | rén | Yáng | E2 | 癸 | 癸 | guǐ | Yīn |
| S2 | 辛 | 辛 | xīn | 阴 | 陰 | Yīn | | 壬 | 壬 | rén | Yáng | | S3 | 癸 | 癸 | guǐ |
| S3 | 壬 | 壬 | rén | 阳 | 陽 | Yáng | E2 | 癸 | 癸 | guǐ | Yīn | C2 | 黑 | 黑 | hēi | Black |
| S4 | 癸 | 癸 | guǐ | 阴 | 陰 | Yīn | | 金 | 金 | jīn | Metal | | C1 | 白 | 白 | bái |

| Chinese Character Table 2 – Branch, Animal | | | | | | | | | |
|--|---|---|------|--------|---|---|------|---------|--|
| Branch | | | | Animal | | | | | |
| B9 | 子 | 子 | zǐ | A9 | 鼠 | 鼠 | shǔ | Rat | |
| B10 | 丑 | 丑 | chǒu | A10 | 牛 | 牛 | niú | Ox | |
| B11 | 寅 | 寅 | yín | A11 | 虎 | 虎 | hǔ | Tiger | |
| B12 | 卯 | 卯 | mǎo | A12 | 兔 | 兔 | tù | Rabbit | |
| B1 | 辰 | 辰 | chén | A1 | 龙 | 龍 | lóng | Dragon | |
| B2 | 巳 | 巳 | sì | A2 | 蛇 | 蛇 | shé | Snake | |
| B3 | 午 | 午 | wǔ | A3 | 马 | 馬 | mǎ | Horse | |
| B4 | 未 | 未 | wèi | A4 | 羊 | 羊 | yáng | Sheep | |
| B5 | 申 | 申 | shēn | A5 | 猴 | 猴 | hóu | Monkey | |
| B6 | 酉 | 酉 | yǒu | A6 | 鸡 | 雞 | jī | Rooster | |
| B7 | 戌 | 戌 | xū | A7 | 狗 | 狗 | gǒu | Dog | |
| B8 | 亥 | 亥 | hài | A8 | 猪 | 豬 | zhū | Pig | |

| Chinese Character Table 3 – Other Characters | | | | | | | | | | | |
|--|---|-----|---|---|-----|---|---|------|---|---|-----|
| 新 | 新 | xīn | 过 | 過 | guò | 年 | 年 | nián | 好 | 好 | hǎo |

Perpetual Traditional Chinese Calendar Cube Layout

In this *particular* design, *all* the preceding Branches, Stems, Elements, Colors and Animals Chinese Names can be displayed on a Cube.

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

- 1- Branches and Stems on Top Layer
- 2- Elements, Colors, *Yīn/Yáng* and *Guò Nián Hǎo* on Middle Layer
- 3- Animals on Bottom Layer

Top Layer Layout



Characters on the Top Layer are sorted out as follows:

- 1- 1 **T**op **L**eft blank on 1 corner cube: blank (see Bottom Layer Layout)
- 2- 10 **T**op **C**enter characters (Stem) on edge cubes: S1, S2, S3, S4, S5, S6, S7, S8, S9, S10
- 3- 12 **T**op **R**ight characters (Branch) on corner cubes: B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, B11, B12

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

- 1- 5 **T**op **C**enter edge cubes: (S1,S2), (S3,S4), (S5,S6), (S7,S8), (S9,S10)
- 2- 4 **T**op **R**ight corner cubes: (B1,B2,B3), (B4,B5,B6), (B7,B8,B9), (B10,B11,B12)

So, now there are 4 corner and 7 edge cubes left that can be used for the 2 remaining layers.

Middle Layer Layout



Characters on the Middle Layer are sorted out as follows:

- 1- 3 **M**iddle **L**eft characters (*Yīn/Yáng/Guò*) on edge cubes: *Yīn*, *Yáng*, *Guò*, *Xīn*
- 2- 6 **M**iddle **C**enter characters (Elements/*Nián*) on center cubes: E1, E2, E3, E4, E5, *Nián*
- 3- 6 **M**iddle **R**ight characters (Colors/*Hǎo*) on edge cubes: C1, C2, C3, C4, C5, *Hǎo*

Characters are now *logically* combined on edge cubes:

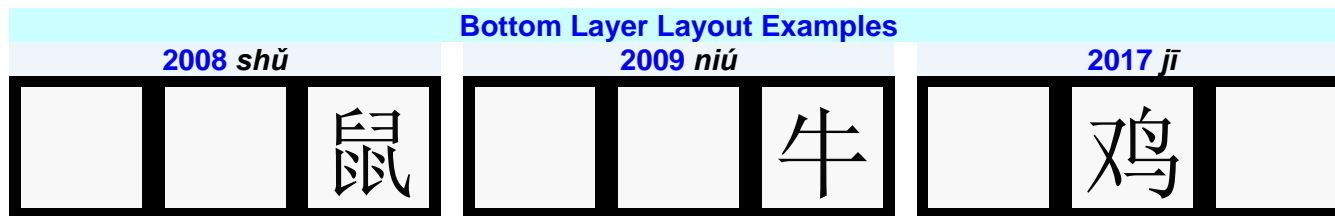
- 1- 2 **M**iddle **L**eft edge cubes: (*Yīn*, *Yáng*), (*Guò*, *Xīn*)
- 2- 3 **M**iddle **R**ight edge cubes: (C1,C2), (C3,C4), (C5,*Hǎo*)

Note 1 – 过年好 *Guò Nián Hǎo* means 'Happy New Year' for the 1st day of the *traditional* chinese New Year, which is *definitively* **not** the the 1st of January, but a day between the 20th of January and the 21st of February.

Note 2 – 新年好 *Xīn Nián Hǎo* means 'Happy New Year' for the 1st day of the *international* New Year, which is the 1st of January.

So, now there are 4 corner and 2 edge cubes left that can be used for the Bottom Layer.

Bottom Layer Layout



Characters on the Bottom Layer are sorted out as follows:

- 1- 3 **B**ottom **C**enter characters (Animal) on edge cubes: A10, A11, A12, blank
- 2- 9 **B**ottom **R**ight characters (Animal) on corner cubes: A1, A2, A3, A4, A5, A6, A7, A8, A9

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

- 1- 2 **B**ottom **C**enter edge cubes: (A10,A11), (A12,blank)
- 2- 4 **B**ottom **R**ight corner cube: (A1,A2,A3), (A4,A5,blank), (A6,A7,blank), (A8,A9,blank)

Note 3 – There are 3 **B**ottom **R**ight corner cubes with 1 blank each. This ensures that for Animals A1 – A9, there will be *at least* 1 blank to be used on a **B**ottom **L**eft corner and 1 blank on a **T**op **L**eft corner. For Animals A10 – A12, there will be 3 blanks to be used on **B**ottom **L**eft, **B**ottom **R**ight and **T**op **L**eft corners.

| Perpetual Traditional Chinese Calendar: Characters Orientation – Recap | | |
|--|-------------------------------------|--|
| Top Left – Corner cubes | Top Center – Edge cubes | Top Right – Corner cubes |
| | S1,S2,S3,S4,S5,S6,S7,S8,S9,S10 | B1,B2,B3,B4,B5,B6,B7,B8,B9,B10,B11,B12 |
| Middle Left – Edge cubes | Middle Center – Center cubes | Middle Right – Edge cubes |
| <i>Yīn, Yáng, Guò, Xīn</i> | E1,E2,E3,E4,E5, <i>Nián</i> | C1,C2,C3,C4,C5, <i>Hǎo</i> |
| Bottom Left – Corner cubes | Bottom Center – Edge cubes | Bottom Right – Corner cubes |
| | A10,A11,A12 | A1,A2,A3,A4,A5,A6,A7,A8,A9 |

Perpetual Calendar – Character Localization & Orientation

See [Chinese Characters Tables](#) for match between numbered letters and chinese characters

| | | | | | | | | |
|------------|-----|------------|------------|-------------|------------|-----|-----|-------------|
| | | | B5 | S7 | B7 | | | |
| | | | S4 | E1 | S5 | | | |
| | | | A7 | S2 | B2 | | | |
| B4 | S3 | A6 | | S1 | B1 | B3 | S6 | B8 |
| <i>Yīn</i> | E5 | <i>Yīn</i> | <i>Guò</i> | <i>Nián</i> | <i>Hǎo</i> | C5 | E2 | C1 |
| A8 | A10 | A4 | | | A1 | A3 | C4 | B10 |
| | | | A5 | A12 | A2 | B9 | S8 | B6 |
| | | | A11 | E4 | C3 | C2 | E3 | <i>Yáng</i> |
| | | | | S9 | B11 | B12 | S10 | A9 |

| | | | |
|------|-------|-------|------|
| | Up | | |
| Left | Front | Right | Back |
| | Down | Back | |

Yearly Traditional Chinese Calendar Cube Layout

In this *particular* design, *all* the preceding Branches, Stems and Animals Chinese Names, together with the 2 *last* numbers of a Year, can be displayed on a Cube.

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

- 4- Branches and Stems on Top Layer
- 5- Two last digits of a Year on Middle Layer
- 6- Animals on Bottom Layer

Top Layer Layout



Characters on the Top Layer are sorted out as follows:

- 4- 1 **T**op **L**eft blank on 1 corner cube: blank (see Bottom Layer Layout)
- 5- 10 **T**op **C**enter characters (Stem) on edge cubes: S1, S2, S3, S4, S5, S6, S7, S8, S9, S10
- 6- 12 **T**op **R**ight characters (Branch) on corner cubes: B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, B11, B12

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

- 3- 5 **T**op **C**enter edge cubes: (S1,S2), (S3,S4), (S5,S6), (S7,S8), (S9,S10)
- 4- 4 **T**op **R**ight corner cubes: (B1,B2,B3), (B4,B5,B6), (B7,B8,B9), (B10,B11,B12)

So, now there are 4 corner and 7 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:

- 4- 5 **M**iddle **L**eft numbers and 1 blank on edge cubes: 0, 1, 2, 3, 4, blank
- 5- 7 **M**iddle **C**enter numbers on center cubes: 0, 1, 2, 3, 4, 6(9)
- 6- 3 **M**iddle **R**ight numbers and 1 character on edge cubes: 5, 8, 7, *Nian*

Characters are now *logically* combined on edge cubes:

- 3- 3 **M**iddle **L**eft edge cubes: (0,1), (2,3), (4, blank)
- 4- 2 **M**iddle **R**ight edge cubes: (5,8), (7, *Nian*)

Note 4 – All integer numbers from **00** up to **49** can be displayed on the Middle Layer

Note 5 – Character '*Nian*' (Year) is displayed **Right**, depending on Year last digit

Note 6 – Numbers (Years) that end with 0, 1, 2, 3, 4, 6, 9 are displayed on the left-hand side

Note 7 – Numbers (Years) that end with 0, 1, 2, 3, 4, 6, 9 are followed by character '*Nian*' on the right-hand side

Note 8 – Numbers (Years) that end with 5, 7, 8 are displayed on the right-hand side

Note 9 – Numbers (Years) that end with 5, 7, 8 are preceded by a 'blank' on the left-hand side

Note 10 – Numbers 00,10, 20, 30, 40 can be displayed either on the left- or right-hand side

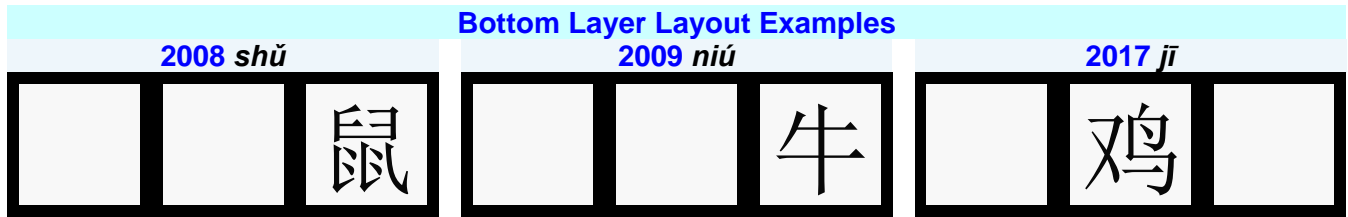
Note 11 – 8 *Supplementary* numbers can be displayed **Middle Right**: 60, 65, 67, 68, 90, 95, 97, 98

Note 12 – 7 *Supplementary* numbers can be displayed **Middle Left**: *80, *81, *82, *83, *84, *86, *89

* Number '8' should be redrawn if 180° rotated

So, now there are 4 corner and 2 edge cubes left that can be used for the Bottom Layer.

Bottom Layer Layout



Characters on the Bottom Layer are sorted out as follows:

- 3- 3 Bottom Center characters (Animal) on edge cubes: A10, A11, A12, blank
- 4- 9 Bottom Right characters (Animal) on corner cubes: A1, A2, A3, A4, A5, A6, A7, A8, A9

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

- 3- 2 Bottom Center edge cubes: (A10,A11), (A12,blank)
- 4- 4 Bottom Right corner cube: (A1,A2,A3), (A4,A5,blank), (A6,A7,blank), (A8,A9,blank)

Note 13 – There are 3 Bottom Right corner cubes with 1 blank each. This ensures that for Animals A1 – A9, there will be *at least* 1 blank to be used on a Bottom Left corner and 1 blank on a Top Left corner. For Animals A10 – A12, there will be 3 blanks to be used on Bottom Left, Bottom Right and Top Left corners.

| Yearly Traditional Chinese Calendar: Characters Orientation – Recap | | |
|---|--------------------------------|--|
| Top Left – Corner cubes | Top Center – Edge cubes | Top Right – Corner cubes |
| | S1,S2,S3,S4,S5,S6,S7,S8,S9,S10 | B1,B2,B3,B4,B5,B6,B7,B8,B9,B10,B11,B12 |
| Middle Left – Edge cubes | Middle Center – Center cubes | Middle Right – Edge cubes |
| 0,1,2,3,4 | 0,1,2,3,4,6 | 5,7,8,Nián |
| Bottom Left – Corner cubes | Bottom Center – Edge cubes | Bottom Right – Corner cubes |
| | A10,A11,A12 | A1,A2,A3,A4,A5,A6,A7,A8,A9 |

Yearly Calendar – Character Localization & Orientation

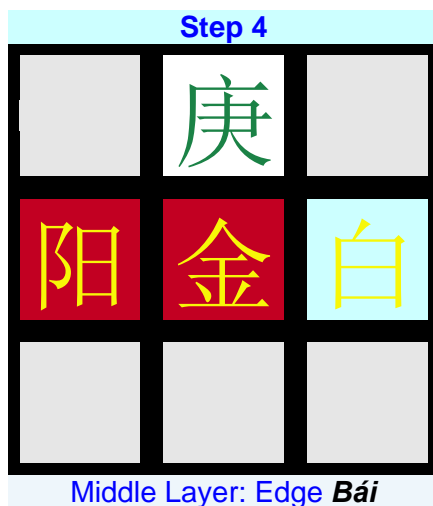
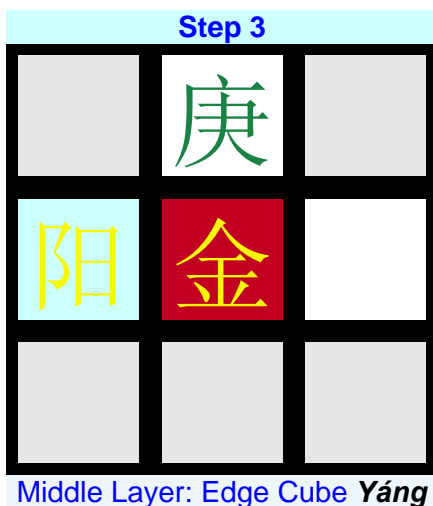
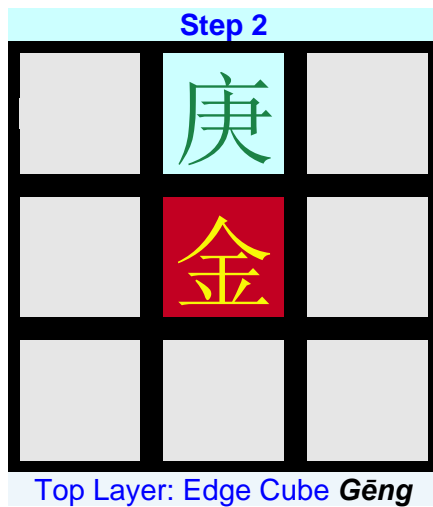
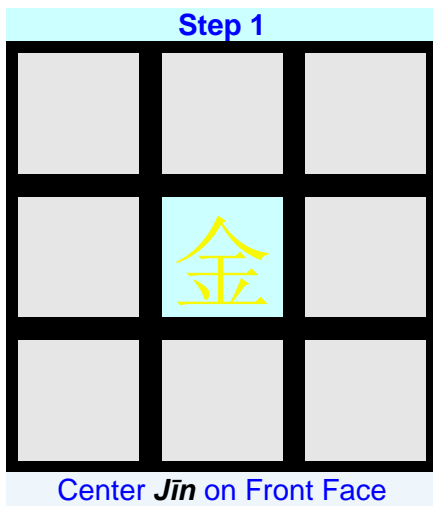
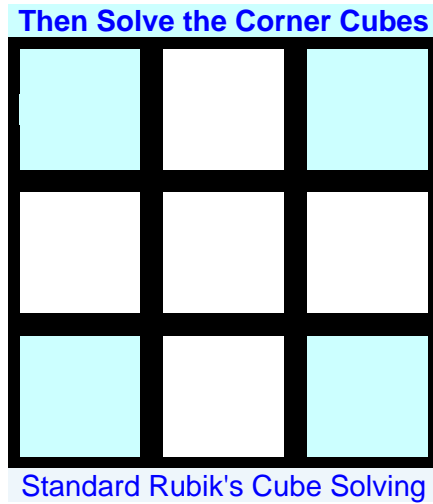
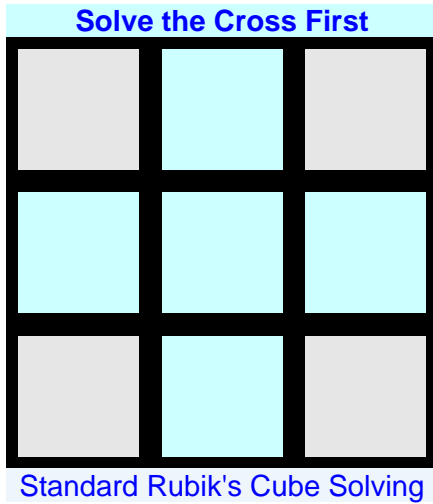
See [Chinese Characters Tables](#) for match between numbered letters and chinese characters

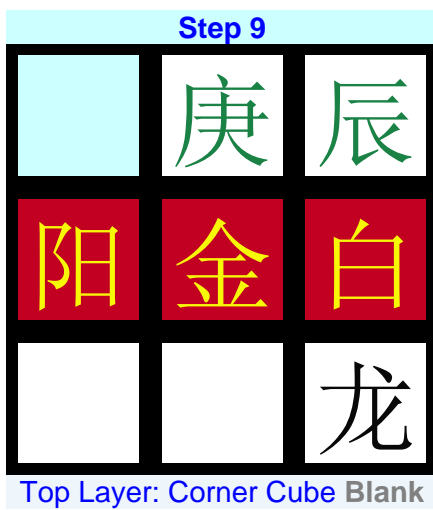
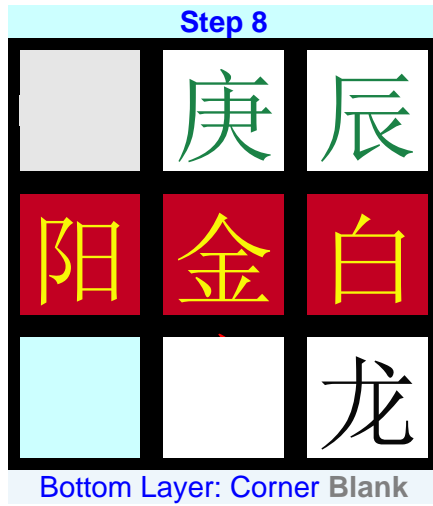
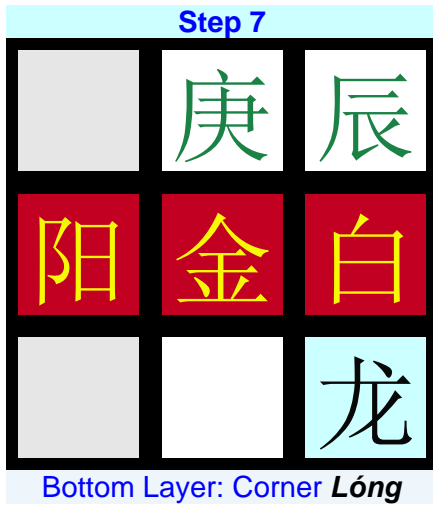
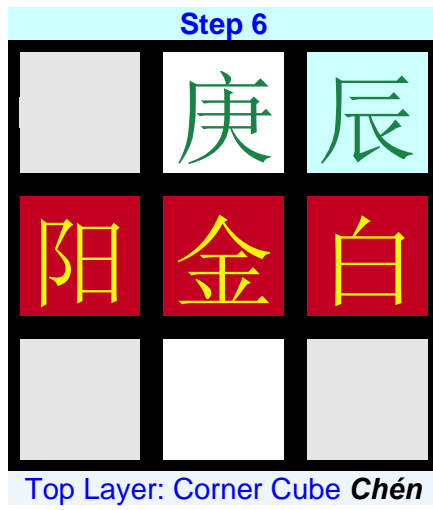
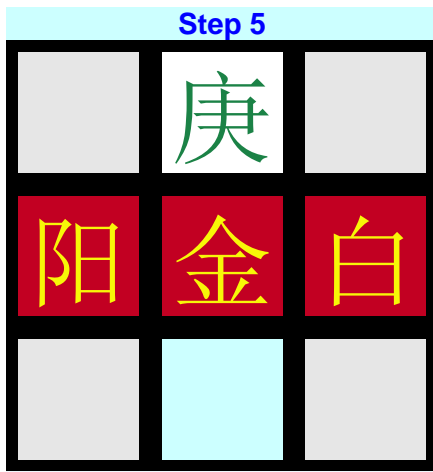
| | | | | | | | | |
|----|-----|----|-----|-----|-------------|-----|-----|-----|
| | | | B5 | S7 | B7 | | | |
| | | | S4 | 1 | S5 | | | |
| | | | A7 | S2 | B2 | | | |
| B4 | S3 | A6 | | S1 | B1 | B3 | S6 | B8 |
| 2 | 6 | 1 | 0 | 0 | <i>Nián</i> | 7 | 2 | 5 |
| A8 | A10 | A4 | | | A1 | A3 | | B10 |
| | | | A5 | A12 | A2 | B9 | S8 | B6 |
| | | | A11 | 4 | 4 | 8 | 3 | 3 |
| | | | | S9 | B11 | B12 | S10 | A9 |

| | | | |
|------|-------|-------|------|
| | Up | | |
| Left | Front | Right | Back |
| | Down | Back | |

Solving a Perpetual Traditional Chinese Calendar Cube Step by Step

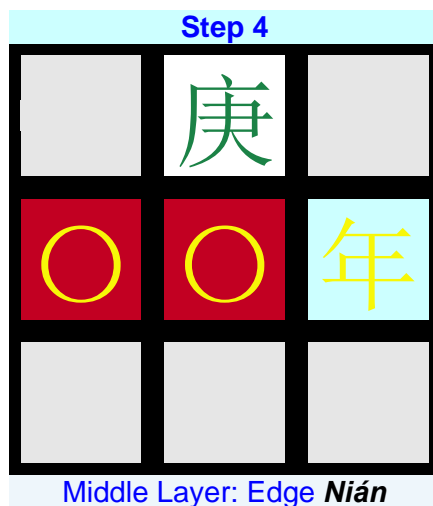
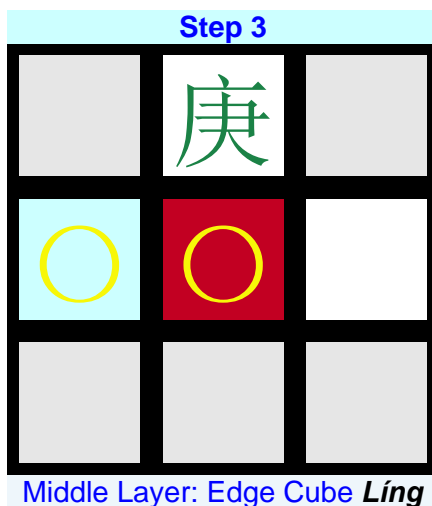
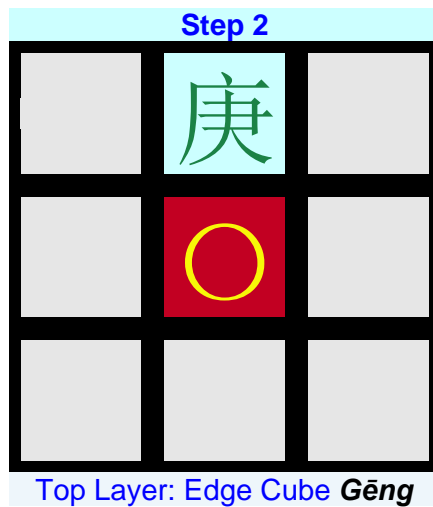
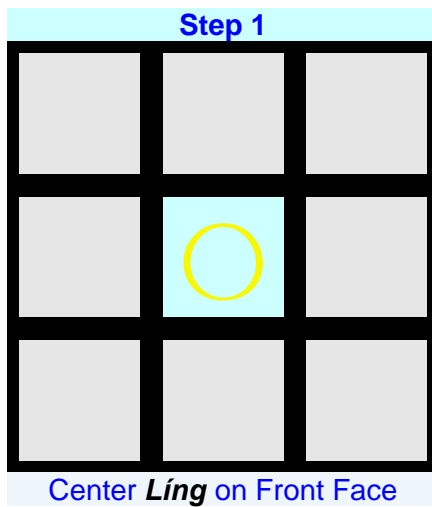
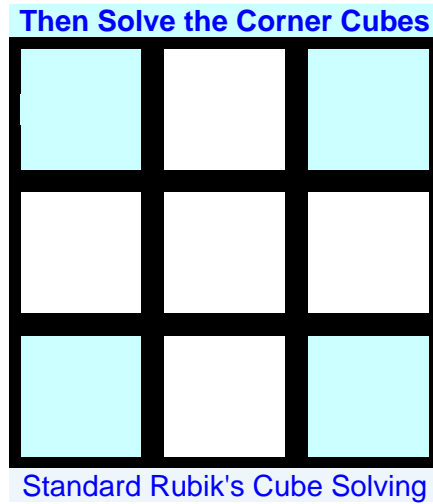
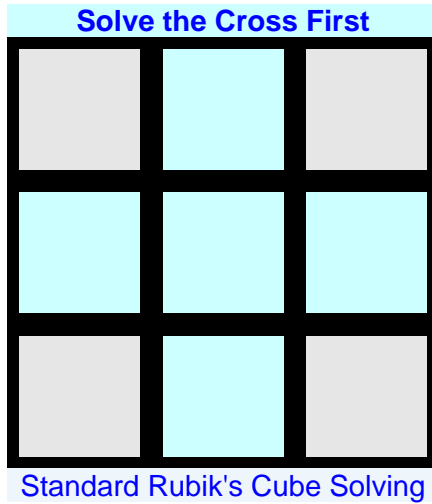
In this example, a step by step solving process is applied to the Traditional Chinese Calendar Cube, just described before. Note that we only need to solve a *single* Face out of six. We will solve a Face for Year 2000.

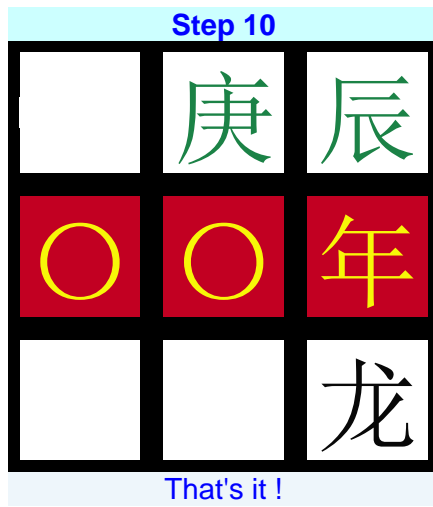
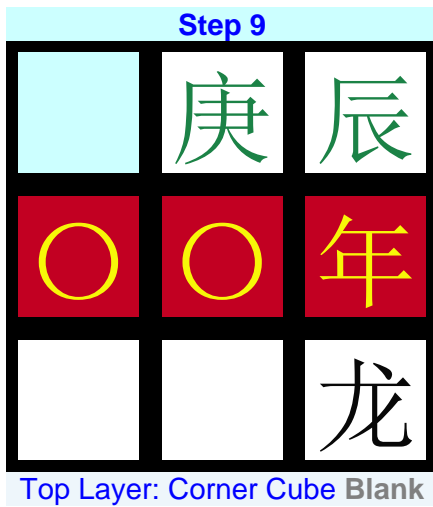
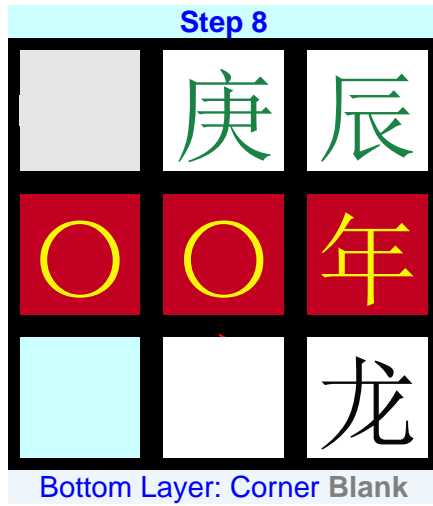
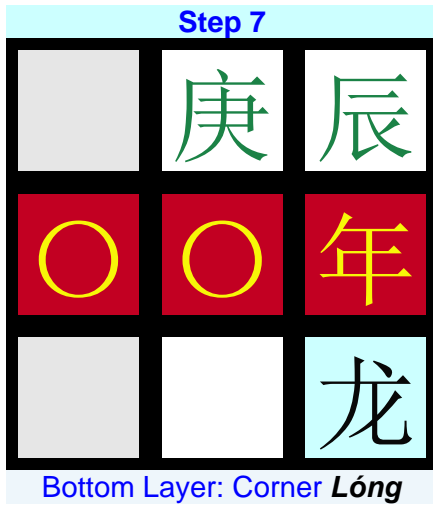
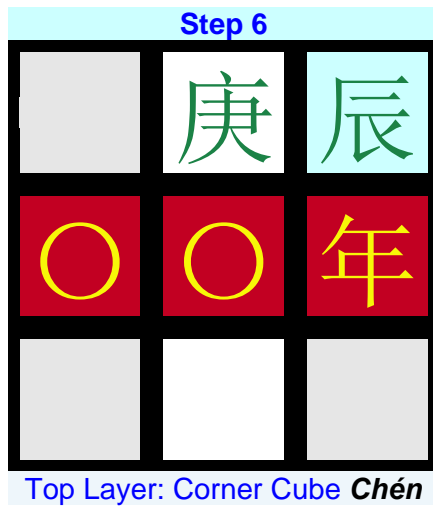
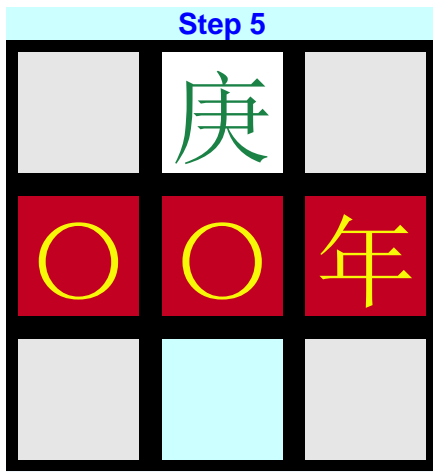




Solving a Yearly Traditional Chinese Calendar Cube Step by Step

In this example, a step by step solving process is applied to the Traditional Chinese Calendar Cube, just described before. Note that we only need to solve a *single* Face out of six. We will solve a Face for Year 2000.

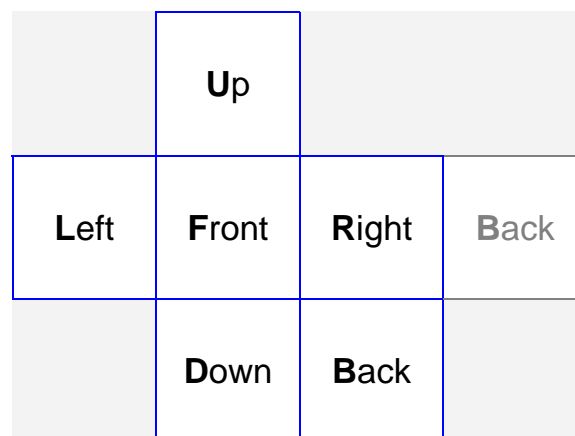




| TL | TC | TR | | | | | | |
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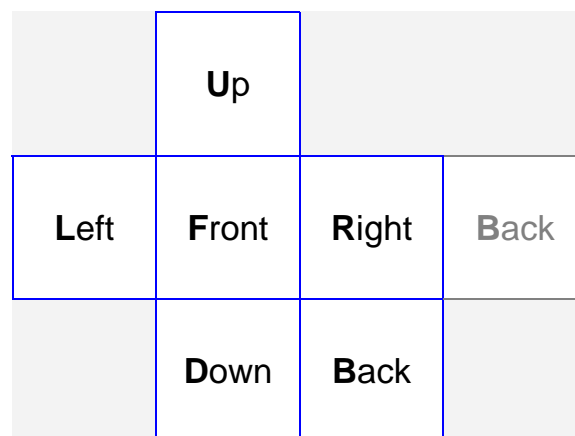
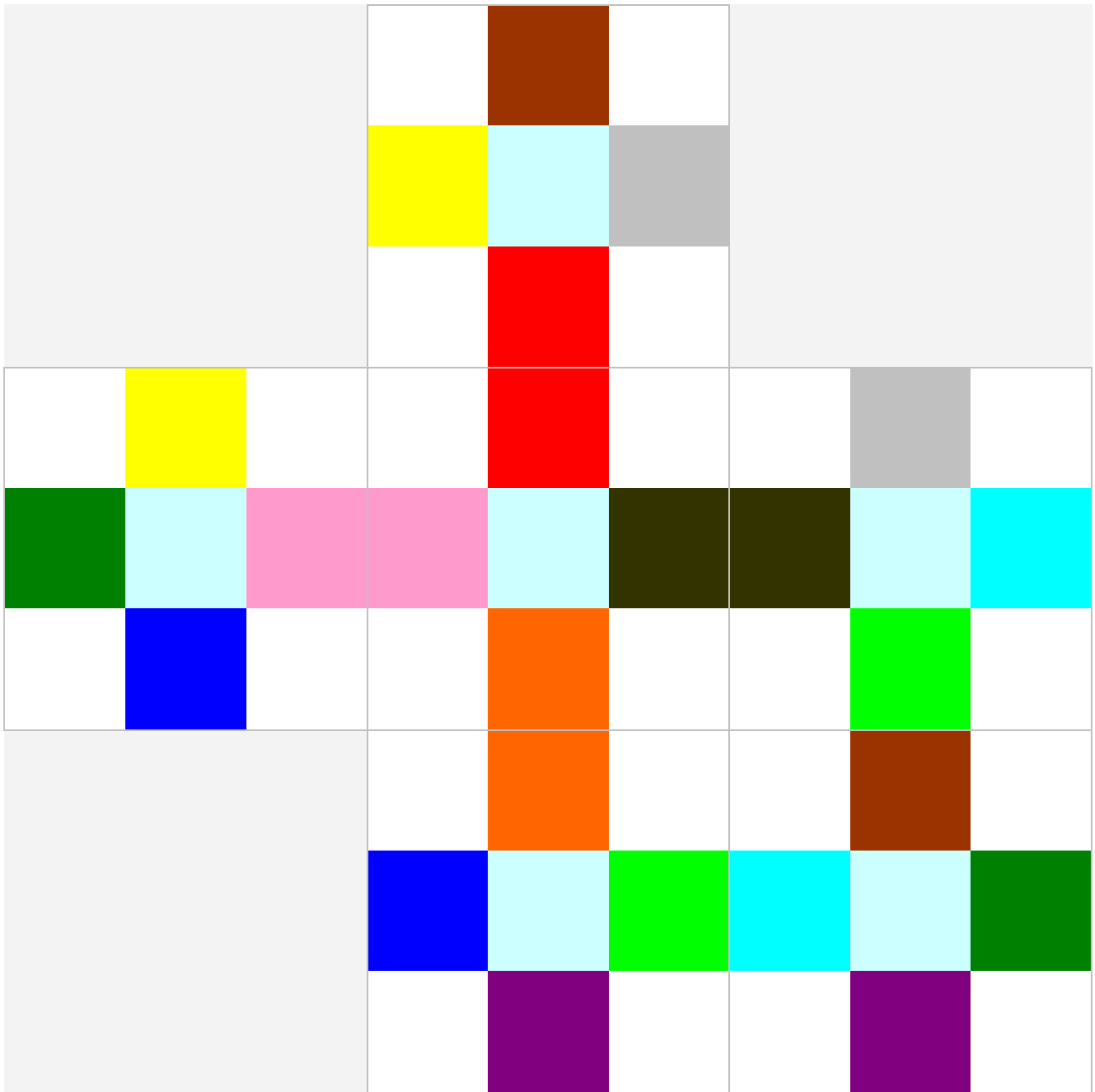
Corner Cubes Final Check

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.

