Report

Yellow everyone:
the standard colour set, a common ratio,
contrast and individualities

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Abstract
This paper proposes that there should be a set of six standard colours and only a small number of non-standard colours. My study aims to clarify the norms of that colour set with respect to red/green/blue. It also proposes that every national flag whose current specification is in a 'non-standard' ratio should also make their flag available in a newly confirmed 'FIAV Standard Flag Ratio' and in a common size that should be the preferred ratio for multiple visual display. I also hope to specify an acceptable divergence relating to luminosity values when assessing corrective measures, in order to produce better aesthetic values in new and redesigned flags. An understanding of colour usage can show that at many times, such as during the hours of darkness, the colour combination alone is not the best solution in making a visual identification. This results in a request that each nation have an element of an emblem or design layout that is unique, unambiguous and understandable.

Colours

Rule 3 of Ted Kaye's *Good Flag Bad Flag* (*GFBF*) guidelines recommends an ideal use of just two to three colours. I would like to propose a relaxation of this aim, to better allow for greater individuality and wider options in order to produce more depth of essence and visual understanding. Thus, my direction would be for the actual or casual acceptance of up to six colours before castigation or ridicule.


Flag of South Africa: this flag would conform with GFBF *if Rule 3 is expanded to six colours*

No national flag should be considered valid if, like the flag of the Socialist Libyan Arab People's Jamahiriya (1977-2011), it consists of a single colour. The minimum number of colours shall be two, with the primary colour taken from the standard set of red, green or blue, and the secondary colour either white, gold or black. If the minimum number is expanded to three then a colour of the non-standard set could be used. In any flag featuring three colours, both white and gold can appear but must not make more than point contact.

Flag of the Socialist Libyan Arab People's Jamahiriya, 1977-2011 : invalid as a national flag due to its single colour
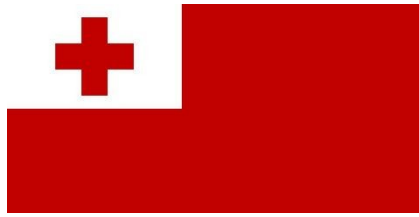
Flag of Samoa: using red from the proposed standard set, plus white

Flag of Nauru: using one primary colour (blue) and two 'secondary' colours (white and gold)

Note that if white is used in any flag design it shall not be present, or 'open', on more than two full edges from any one area without the complementary support of a colour, as in the current flags of Cyprus, Japan and South Korea.

Flag of Cyprus: perhaps too much plain white?

I would like to identify two routes to achieve the baseline colour set. Q: what do five-year-old children use to draw? A: easily available resources. So, these colour baselines could come firstly from the standard set that is the widely produced Crayola 24-colour box of wax crayons:

Standard Crayola Colour Set	
Red	rgb = 228-46-47
Green	rgb = 57-166-81
Blue	rgb = 52-117-201
Black	rgb = 39-39-40
Yellow	rgb = 241-223-78
White	rgb = 245-244-249

This could even be a branded tie-in offered for FIAV sponsorship, going some way to mitigate the cost of the ICV. This fundamental action would refer back to Rule 1 of *GFBF*, that any good flag should be drawable by a five-year-old.

The Orlando (FL) flag contest (2017): the rules specified hand-drawn designs, giving weight to the author's Crayola proposal
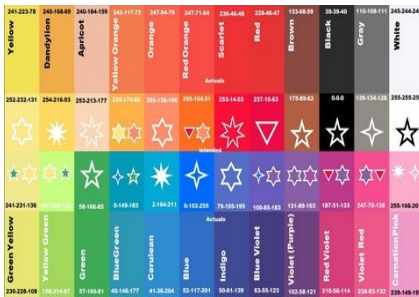
Standard Crayola colour set with RGB values added: the midline colours are the intended shades

The second proposed route would be that of collecting colour data to achieve an average baseline set of figures.

This diagram got me thinking that a fair assessment would be achieved by just sampling and averaging the colours of the flags of the world's most populous countries.

The chart below shows that over 70 per cent of the world population are concentrated in the 20 most populous countries.[1] I include a further seven countries, all with populations exceeding 50 million:

Country	Population	Country	Population
China	1368.2m	Egypt	95.2m
India	1342.5m	DR Congo	82.2m
USA	326.5m	Iran	80.9m
Indonesia	263.5m	Germany	80.8m
Brazil	211.2m	Turkey	80.4m
Pakistan	196.7m	Thailand	68.3m
Nigeria	191.8m	UK	65.5m
Bangladesh	164.8m	France	64.9m
Russia	143.4m	Italy	59.8m
Mexico	130.2m	Tanzania	56.9m
Japan	126m	South Africa	55.4m
Ethiopia	104.3m	Myanmar	54.8m
Philippines	103.8m	South Korea	50.7m
Vietnam	95.4m		

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1   https://www.worldometers.info/world-population/population-by-country/

World Population Percentages

World's most populous nations: over 50 million inhabitants
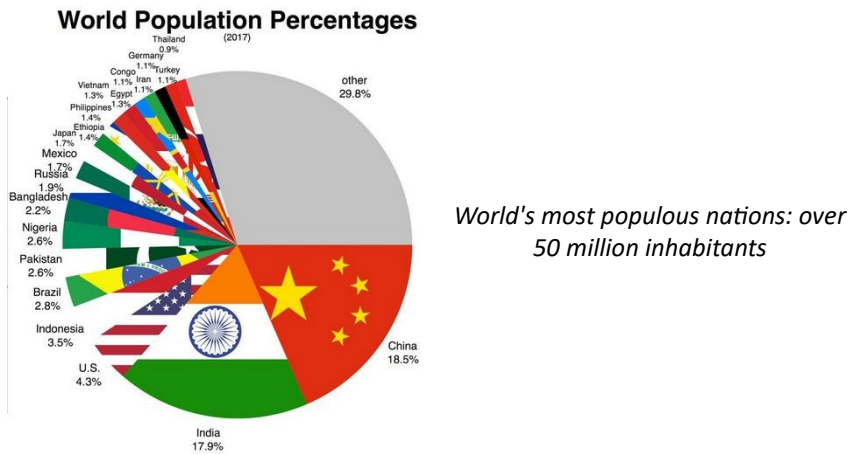
Taking the national flags of each of these countries: 22 contain red; 20, white; 13, blue; 13, gold/yellow; 12, green; and 5, black.
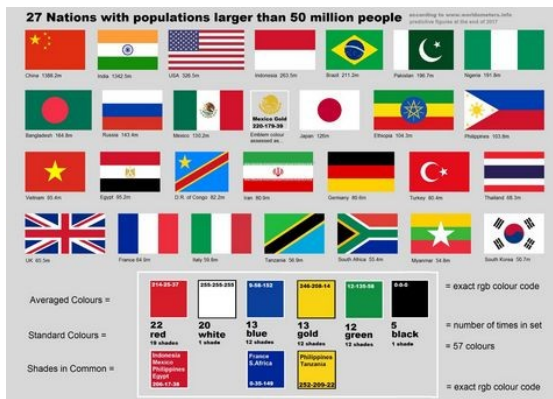
Flags of the world's most populous nations

The reds come in 19 different shades.

The blue, gold and green come in 12 shades each.

I propose that each colour be averaged out to produce a standard set.

The result of this work gives the following RGB values:

Red	214-25-37
White	255-255-255
Blue	9-58-152
Gold	246-208-14
Green	12-135-58
Black	0-0-0

But replacing the original colours with shades from this standardised set demonstrates that some flags, such as those of India, Pakistan, DR Congo and Tanzania, suffer some retrograde visual accuracy.
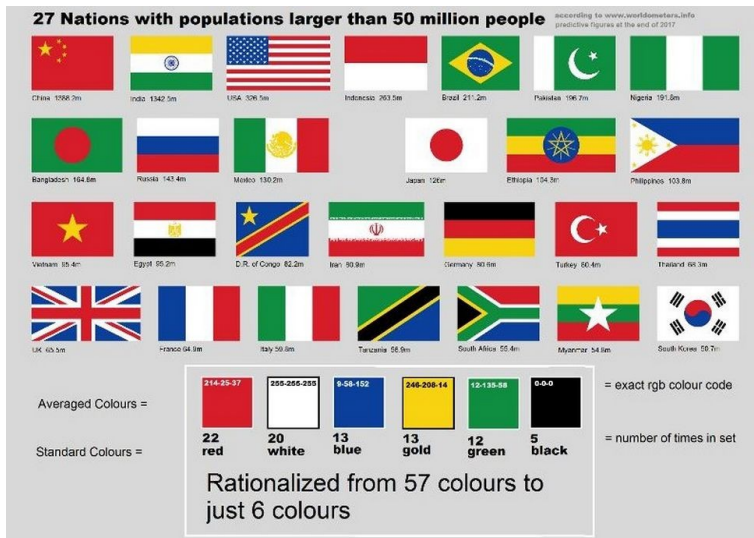
Flags of the world's most populous nations:
in the proposed standard colour set

My solution to this problem is to add four extra colours to the standard set, namely:

Blood	192-0-0
UN blue	75-146-219
Saffron	255-153-51
Dark green	1-65-28

Using these colours to replace the affected colours will remove the problem.
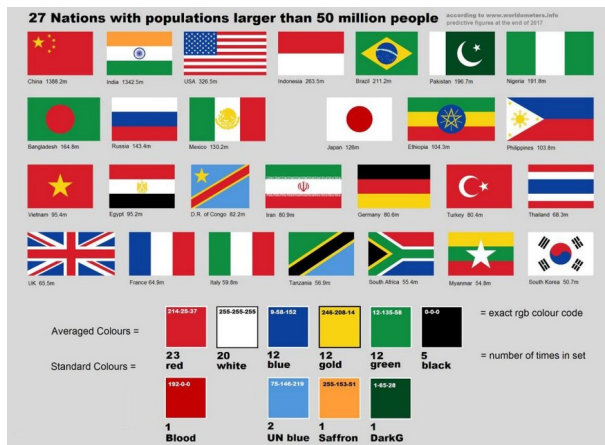
Flags of the world's most populous nations:
in the proposed expanded standard colour set

A common ratio: 195 flags – and amazingly 27 ratios
The UN flag is available in ratios of 2:3 and 3:5. This points the way to a better common ratio of 3:5.

Currently external line-up uses ratio 2:3, but it cramps so many. Internal line-up uses ratio 3:5.

United Nations flag

I've placed a single pixel for each nation and if we zoom in on the area between those longer than square (Switzerland) we find only one significant witness line between 2:3 and 1:2, and that is 3:5.

This ratio is already used by 17 nations and it offers a perfect medium between the big boys.
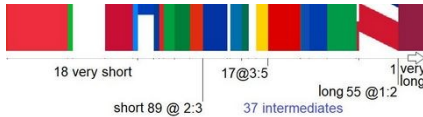
Flag ratios: a diagrammatic representation

Impact of a standardised ratio on the US flag: moving from 10:19 to 3:5

Contrast

A significant percentage of people suffer from colour blindness. Dark flags such as that of Bangladesh will always present contrast issues that do not occur with light flags, e.g. Japan.

Flag of Bangladesh: current
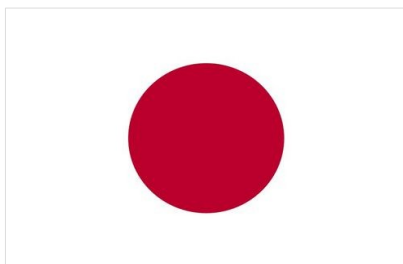
Flag of Japan: contrast of 140 lumens

Then things start to get a little confusing.

As shown in Wikipedia, the flag of Bangladesh looks like this: green, rgb 0-106-78; red, rgb 244-42-95.

Flag of Bangladesh (Wikipedia): contrast of 85 lumens between red and green

But the official specification tells another story: green, rgb 1-121-111; red, rgb 225-24-55.

Flag of Bangladesh (official specification): contrast of 60 lumens

The version using dark green and blood from the proposed colour set would be: green, rgb 0-106-78; red, rgb 192-0-0.

Flag of Bangladesh (proposed standard colour set): contrast of only 40 lumens

The first flag of Bangladesh, which was used from 2 March 1971 to 17 January 1972, included a map of the country. Returning the gold to the flag as a highlight around the central disc provides better contrast and visibility.
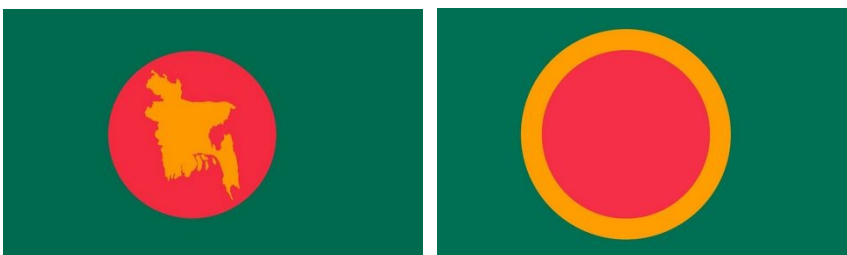
Bangladesh: left, original pattern, with (centre) a national map in gold; right, restoring a gold ring around the red disc increases contrast and visibility; contrast of 70 lumens (green and gold); 30 lumens (gold and red)

Individualities

The flag of Malaysia is rarely confused with the Star-Spangled Banner.

However, some Malaysian voices say they want to lose the stripes ...
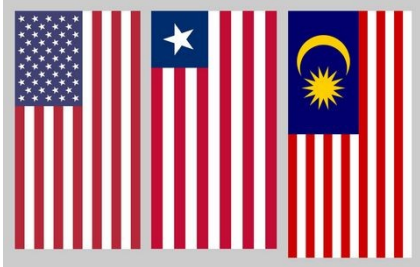
Three striped flags: United States, Liberia, and Malaysia

... which will make their flag more like that of Monaco!

Demonstrators propose their new flag

Similar flags can be very hard to distinguish.

Sometimes only the ratio of the sheet can be used to tell them apart.
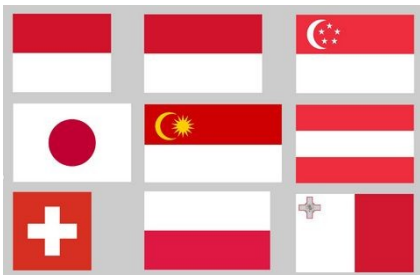
Flags of Monaco (4:5 ratio) and Indonesia (2:3 ratio): can you distinguish them?

Matters would be exacerbated unless further distinguishing characteristics could be added.

Flags of Monaco and Indonesia (author's redesign): using elements or colours from their respective national symbols to make each flag distinctive

Many similar issues arise with white, blue and red.
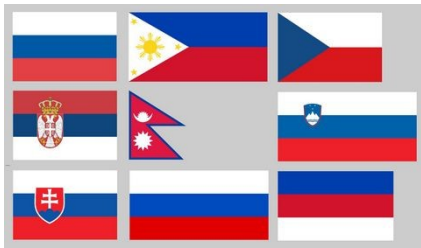
White, blue and red tricolours: sometimes distinguished only by a small shield of arms

Some alterations now make it easier to identify Russia!

White, blue and red tricolours: author's redesign

And returning to the list of most populous nations above, my proposed alterations make it possible to distinguish flags that were previously confusingly similar.

Flags of the world's most populous nations: author's redesign