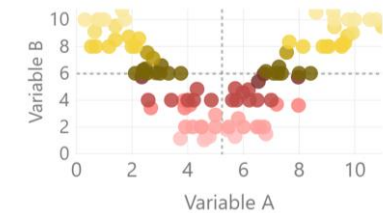

SIZE, COLOUR, AND POSITION

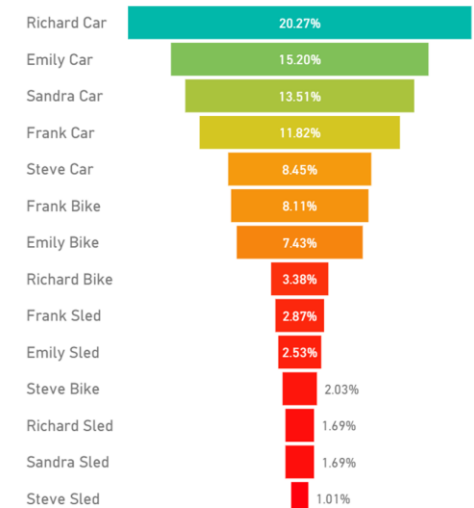
SIZE

Size: assuming that the chart has been decluttered

- things of equal importance size similarly
- other things scale to importance



% of total sales



COLOUR THEORY

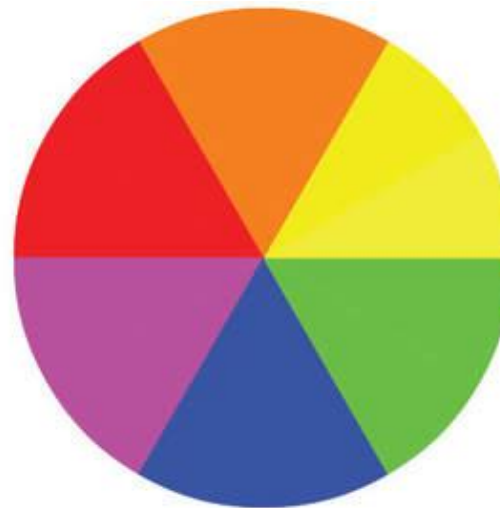
Colour theory (complicated topic – here is a start):

- <http://www.deanenettles.com/webexamples/colorexamples/>
- <https://www.sessions.edu/color-calculator/>

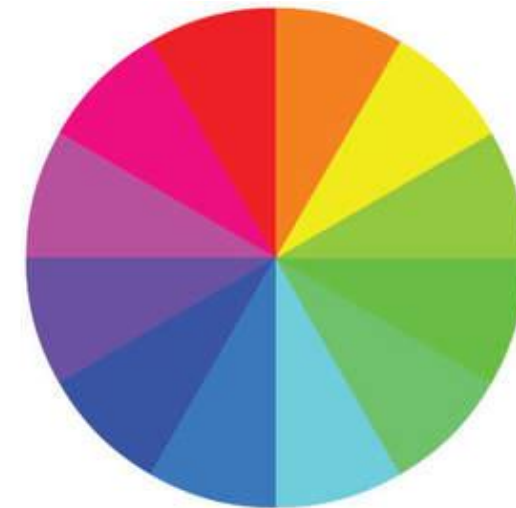
Colour wheels:



Primary Colours



Secondary Colours



Tertiary Colours

COLOUR SCHEMES

Achromatic (colourless, using only blacks, whites and grays)



Monochromatic (1-colour schemes)



Complementary (colours directly across from each other on the colour wheel)



Split complementary (2 of the 3 colors are adjacent; 1 of the colours is opposite)



COLOUR SCHEMES

Split-Left and **Split-Right Complementary** ("split" colours are either to the left or right of the complementary colour)



Analogous (any 3 adjacent primary, secondary, or tertiary colours on the colour wheel)



Colour Diad (2 colours that are 2 colours apart on the color wheel)

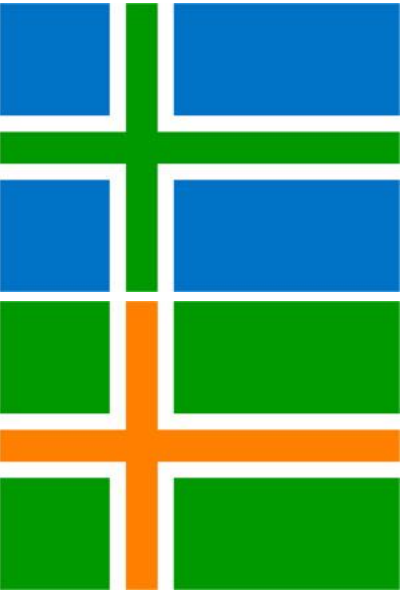
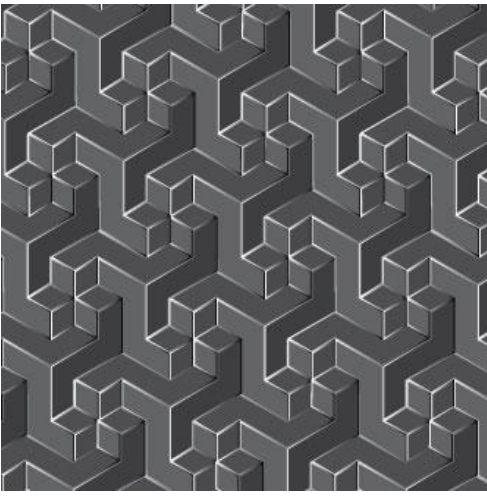
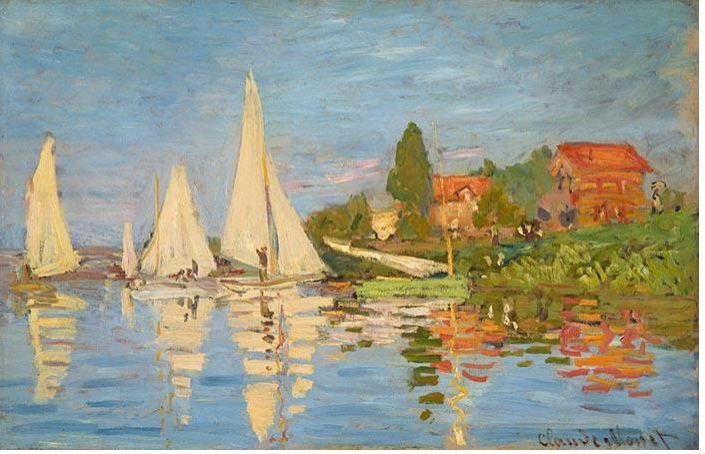
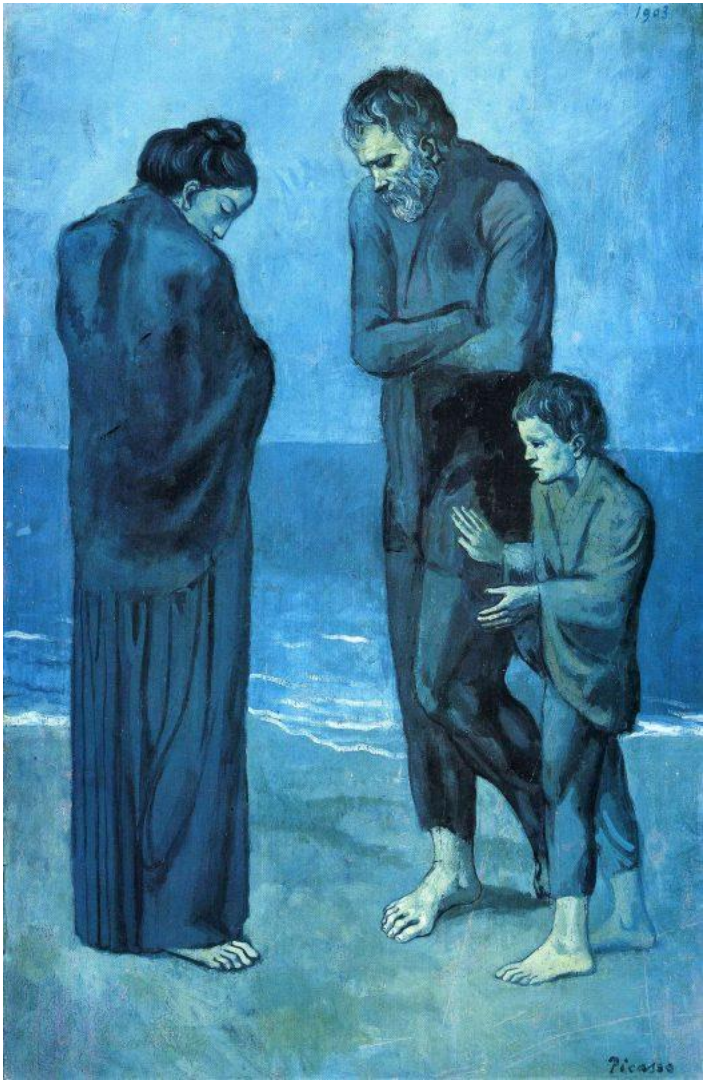


Colour Triad (3 colours, equally distant from each other on the colour wheel)



Colour Tetrad (4 or more colors on the colour wheel)





Can you identify the colour schemes underlying each of these images?



**Monochromatic
(Blues)**



Tetrad



Achromatic



**Diad (Blue
& Green)**



**Triad (Primary
Colors)**



**Diad (Green
& Orange)**



**Analogous
(Green &
Yellow)**



**Diad (Red
& Violet)**



Complementary

Can you identify the colour schemes underlying each of these images?

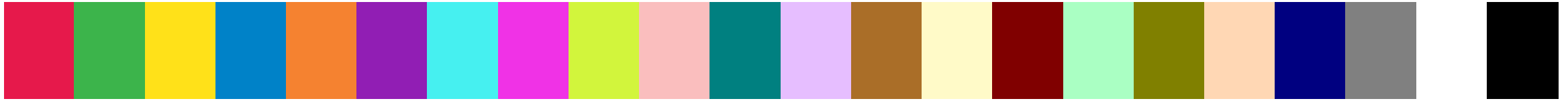
COLOUR PALETTES

Group 1	Group 2	Group 3	Group 4























Zeileis, Hornik & Murrell
24 Distinct Colours

Hex	RGB	Display	Group	Hex	RGB	Display	Group
#023FA5	(2,63,165)		1	#11C638	(17,198,56)		3
#7D87B9	(125,135,185)		1	#8DD593	(141,213,147)		3
#BEC1D4	(190,193,212)		1	#C6DEC7	(198,222,199)		3
#D6BCC0	(214,188,192)		1	#EAD3C6	(234,211,198)		3
#BB7784	(187,119,132)		1	#F0B98D	(240,185,141)		3
#8E063B	(142,6,59)		1	#EF9708	(239,151,8)		3
#4A6FE3	(74,111,227)		2	#0FCFC0	(15,207,192)		4
#8595E1	(133,149,225)		2	#9CDED6	(156,222,214)		4
#B5BBE3	(181,187,227)		2	#D5EAE7	(213,234,231)		4
#E6AFB9	(230,175,185)		2	#F3E1EB	(243,225,235)		4
#E07B91	(224,123,145)		2	#F6C4E1	(246,196,225)		4
#D33F6A	(211,63,106)		2	#F79CD4	(247,156,212)		4

COLOUR PALETTES











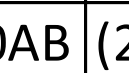
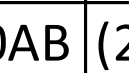
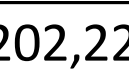
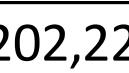
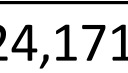
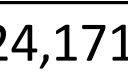
**Kelly's 22
Colours of
Maximum
Contrast**

Name	Hex	RGB	Display	Name	Hex	RGB	Display
Red	#e6194b	(230, 25, 75)		Lavender	#e6beff	(230, 190, 255)	
Green	#3cb44b	(60, 180, 75)		Brown	#aa6e28	(170, 110, 40)	
Yellow	#ffe119	(255, 225, 25)		Beige	#fffac8	(255, 250, 200)	
Blue	#0082c8	(0, 130, 200)		Maroon	#800000	(128, 0, 0)	
Orange	#f58231	(245, 130, 48)		Mint	#aaffc3	(170, 255, 195)	
Purple	#911eb4	(145, 30, 180)		Olive	#808000	(128, 128, 0)	
Cyan	#46f0f0	(70, 240, 240)		Coral	#ffd8b1	(255, 215, 180)	
Magenta	#f032e6	(240, 50, 230)		Navy	#800000	(0, 0, 128)	
Lime	#d2f53c	(210, 245, 60)		Grey	#808080	(128, 128, 128)	
Pink	#fabebe	(250, 190, 190)		White	#FFFFFF	(255, 255, 255)	
Teal	#008080	(0, 128, 128)		Black	#000000	(0, 0, 0)	

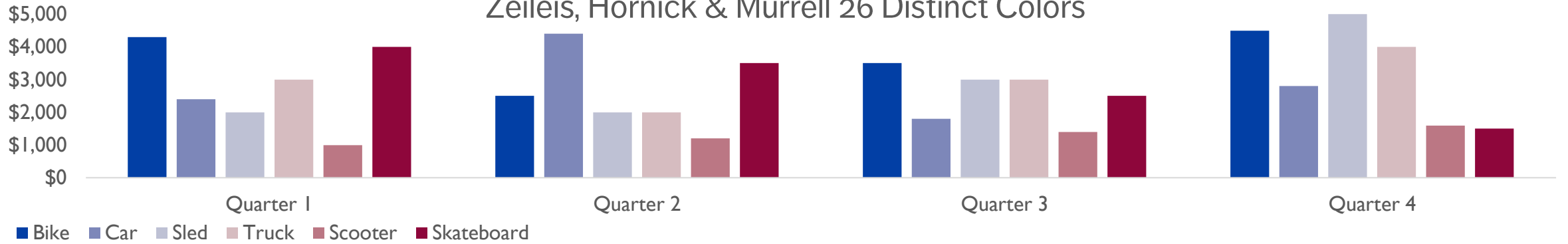
COLOUR PALETTES



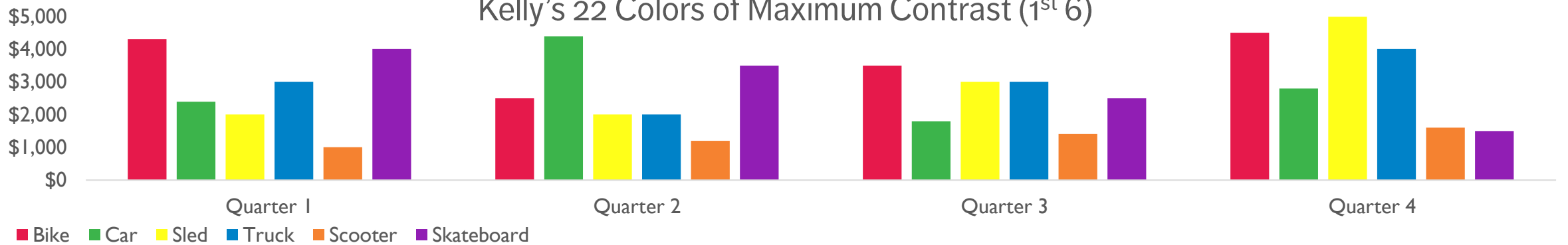
Paul Tol 14 Colour Rainbow Scheme

Hex	RGB	Display	Hex	RGB	Display
#882E72	(136,46,114)		#90C987	(144,201,135)	
#B178A6	(177,120,166)		#CAE0AB	(202,224,171)	
#D6C1DE	(214,193,222)		#F7EE55	(247,238,85)	
#1965B0	(25,101,176)		#F6C141	(246,193,65)	
#5289C7	(82,137,199)		#F1932D	(241,147,45)	
#7BAFDE	(123,175,222)		#E8601C	(232,96,28)	
#4EB265	(78,178,101)		#DC050C	(220,5,12)	

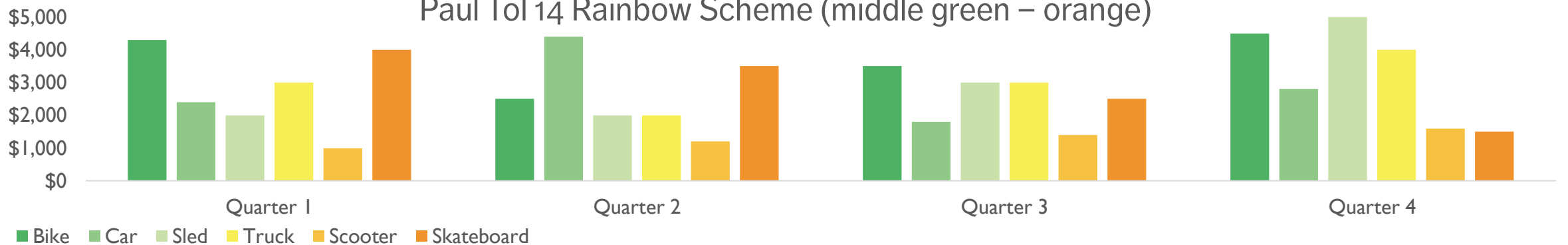
Zeileis, Hornick & Murrell 26 Distinct Colors



Kelly's 22 Colors of Maximum Contrast (1st 6)



Paul Tol 14 Rainbow Scheme (middle green – orange)

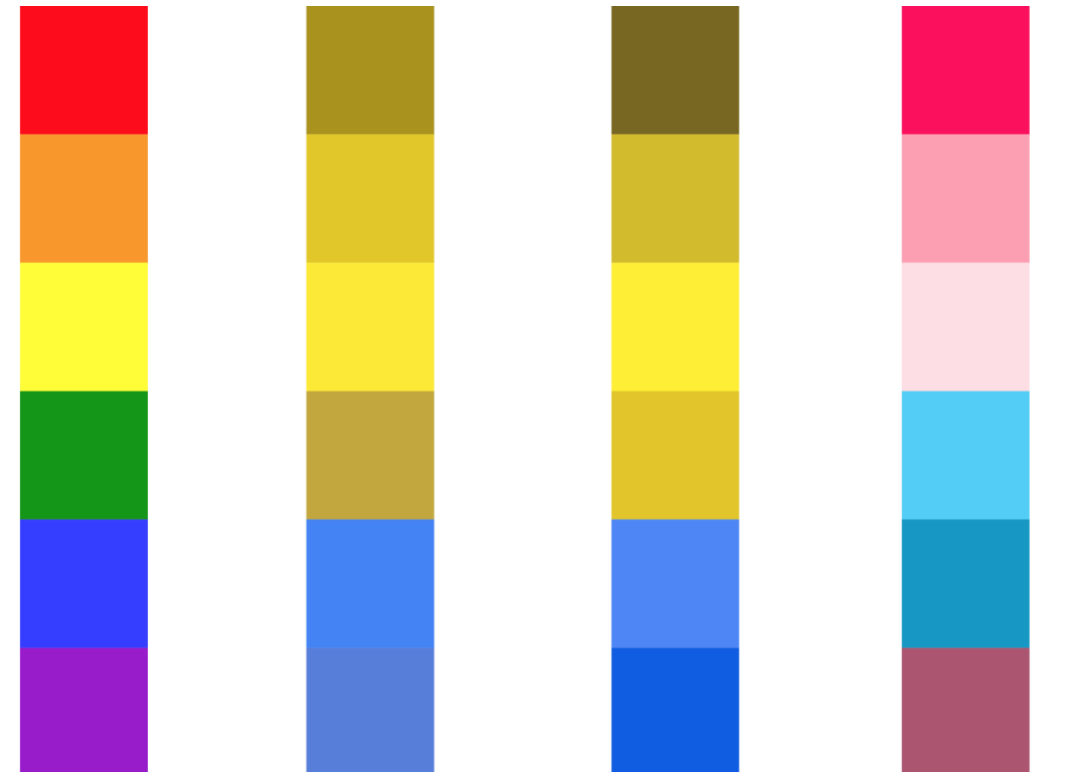


COLOURBLINDNESS

A sizeable proportion of the population (~8%) is **colourblind**, to some degree.

Charts that rely on colours might fail to convey the full extent of the data story to a significant proportion of the audience.

Consider using **contrast-friendly** palettes, and **not using colour alone** to convey the data story.



tritanomal

dueteranope

protanope

tritanerope



normal dichromat

dichromats

COLOUR TIPS

When it comes to colour, **less is more**: use it sparingly (graphic designers are taught to “get it right, in black and white”).

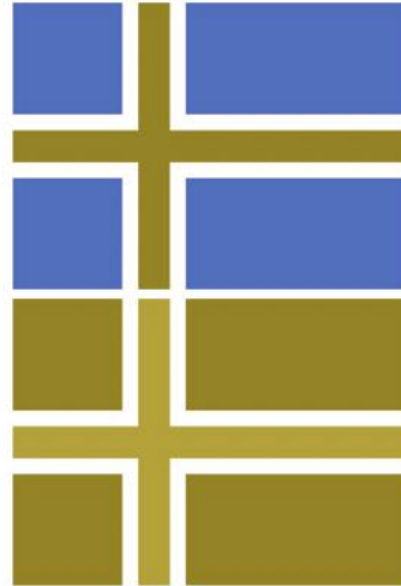
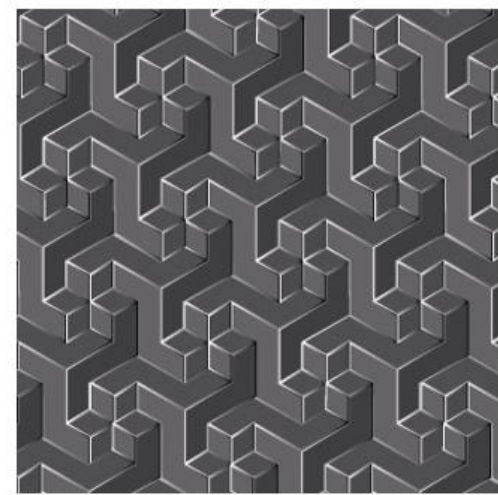
Based on the Gestalt Principles, **monochrome** schemes can be particularly effective.

When appropriate, pick scheme based on corporate identity (this maximizes buy in).

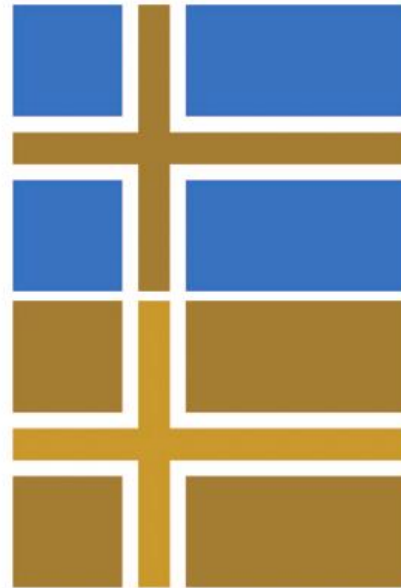
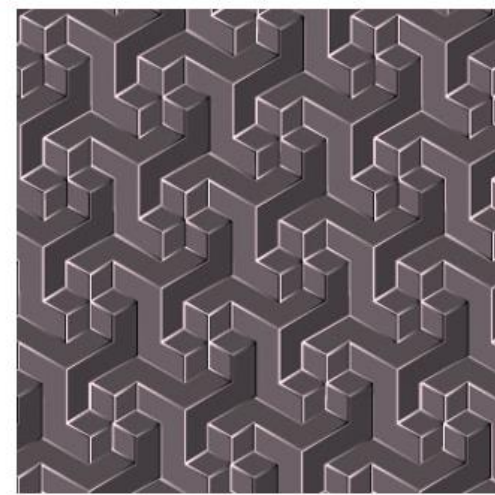
Create a template (and stick to it).

Upload images to see what charts look like in various flavours of colour-blindness:

- <https://www.color-blindness.com/coblis-color-blindness-simulator> (there are other tools)

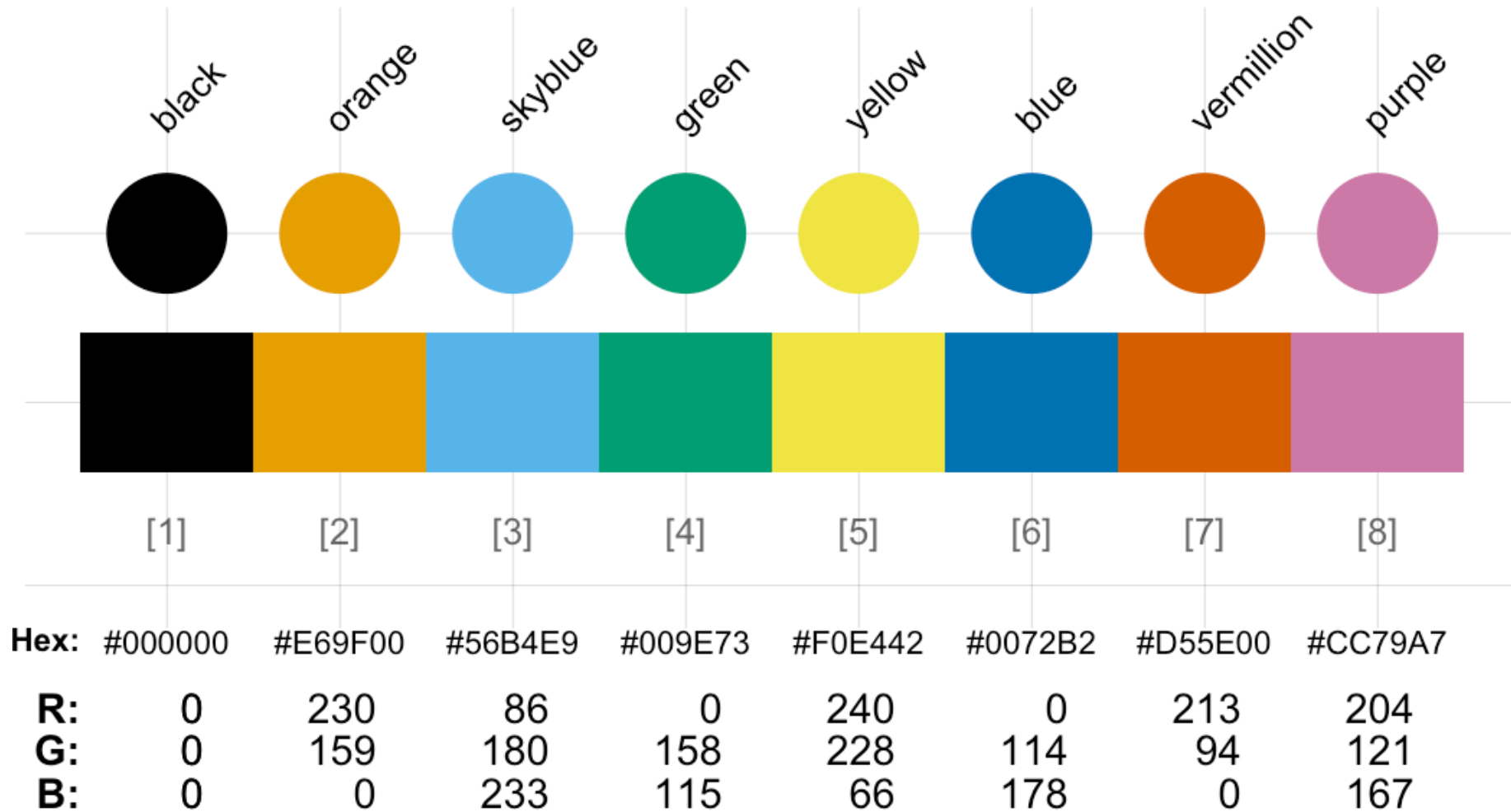


Dichromatic
protanopia
(red-blind)



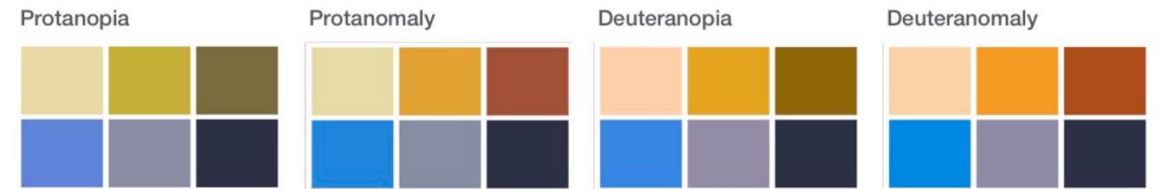
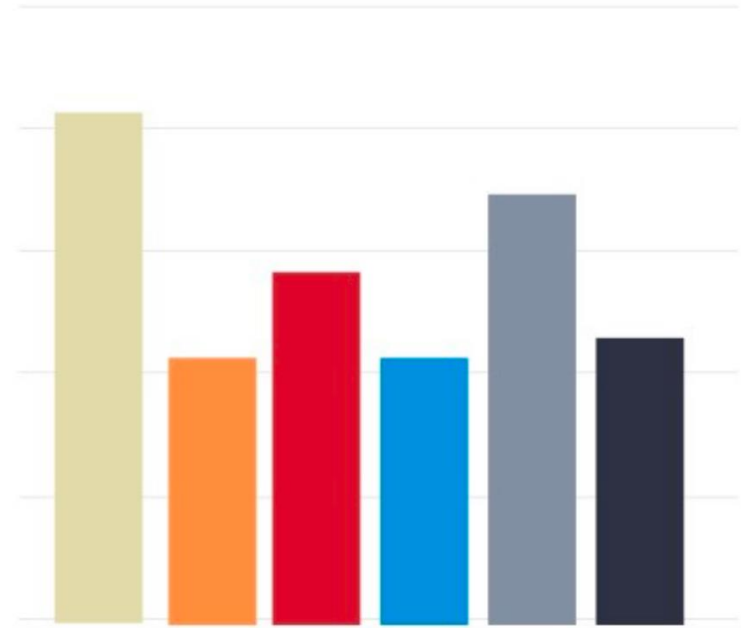
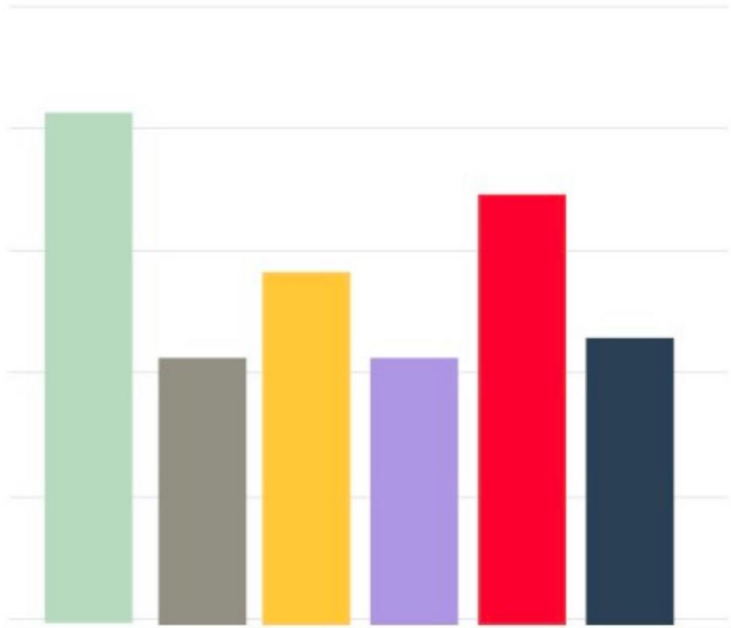
Dichromatic
deuteranopia
(green-blind)

Color-blind friendly color scale (Okabe & Ito, 2002)



#BDD9BF, #929084, #FFC857 #A997DF, #E5323B, #2E4052

#E1DAAE, #FF934F, #CC2D35, #058ED9, #848FA2, #2D3142



SIZE, COLOUR, AND POSITION

How should the elements be placed in a chart or a dashboard?

In the West, most people start at the top left and zig-zag all the way to the bottom right.

Simple rule: don't make people work too hard

- main message: top left/top right
- info in order of preference
- people concentrate less as they scan so get less complex as you move to bottom corner

