National Institutes of Health
Office of Management

Creating Infographics with Inkscape

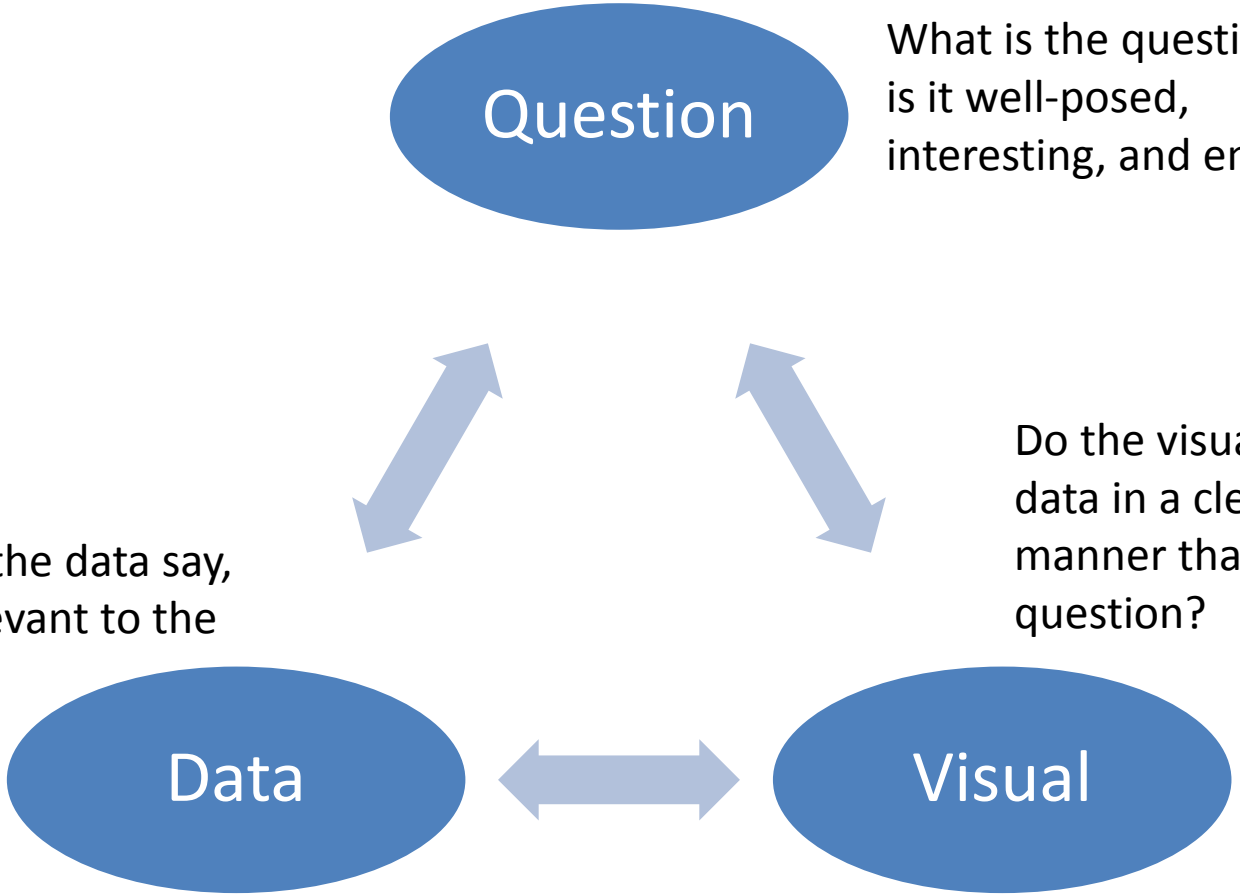
Chris Belter and Lisa Federer
NIH Library

Office of Research Services
National Institutes of Health
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Overview

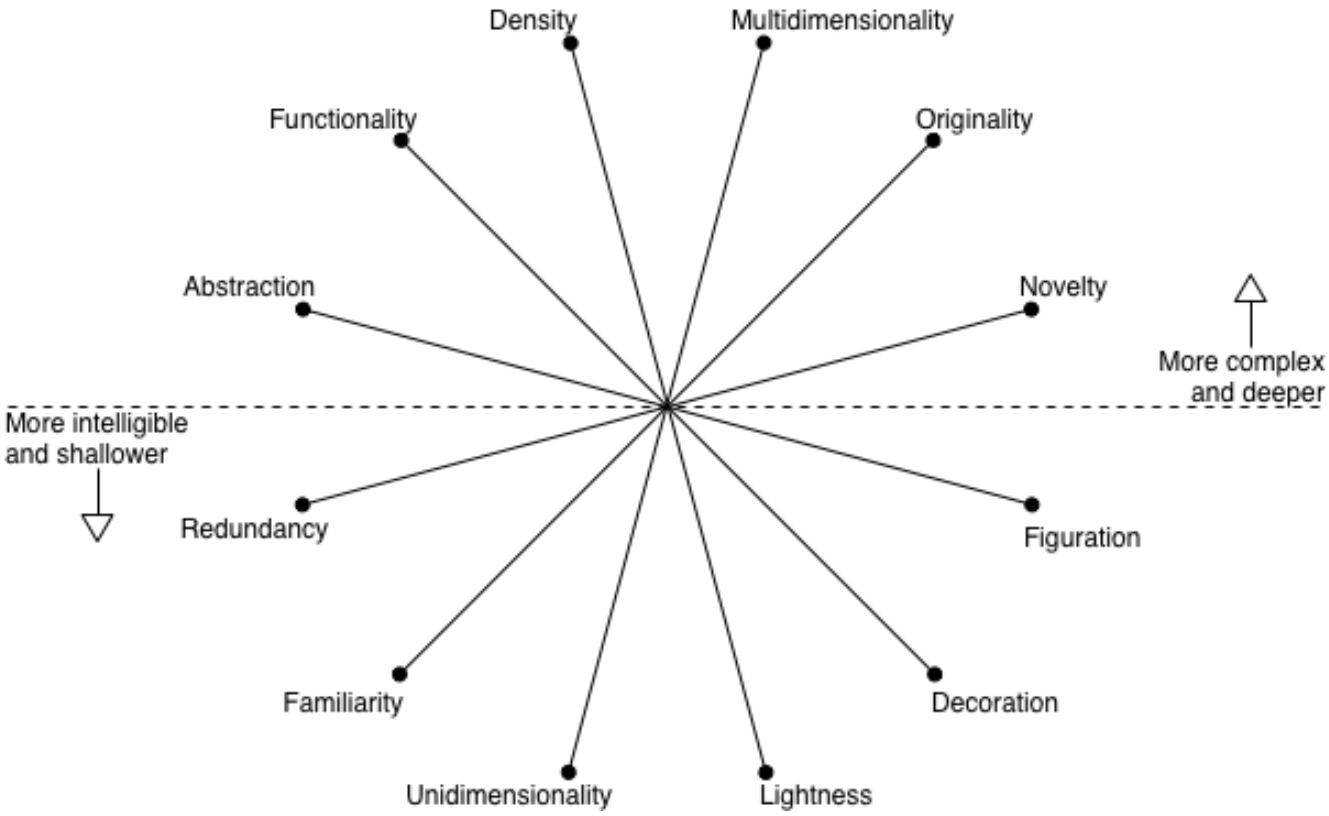
- Visual perception and design
- Elements of design
- Principles of design
- Hands-on practice with Inkscape

Infographic trifecta



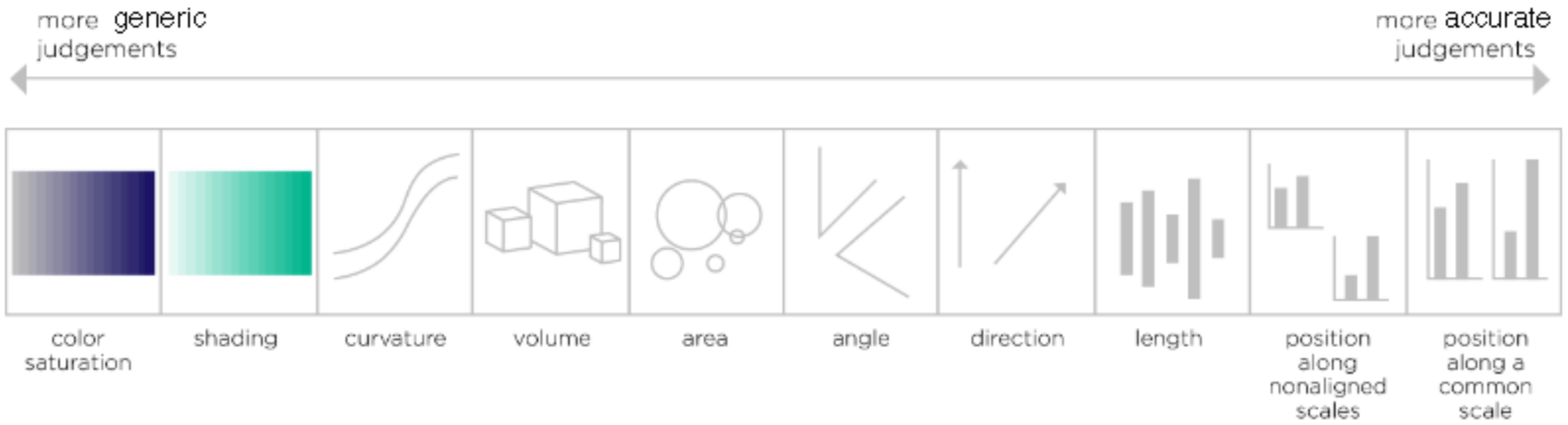
Adapted from Kaiser Fung, http://junkcharts.typepad.com/junk_charts/junk-charts-trifecta-checkup-the-definitive-guide.html

The visualization wheel



From Alberto Cairo, *The Functional Art*

Perceptual tasks

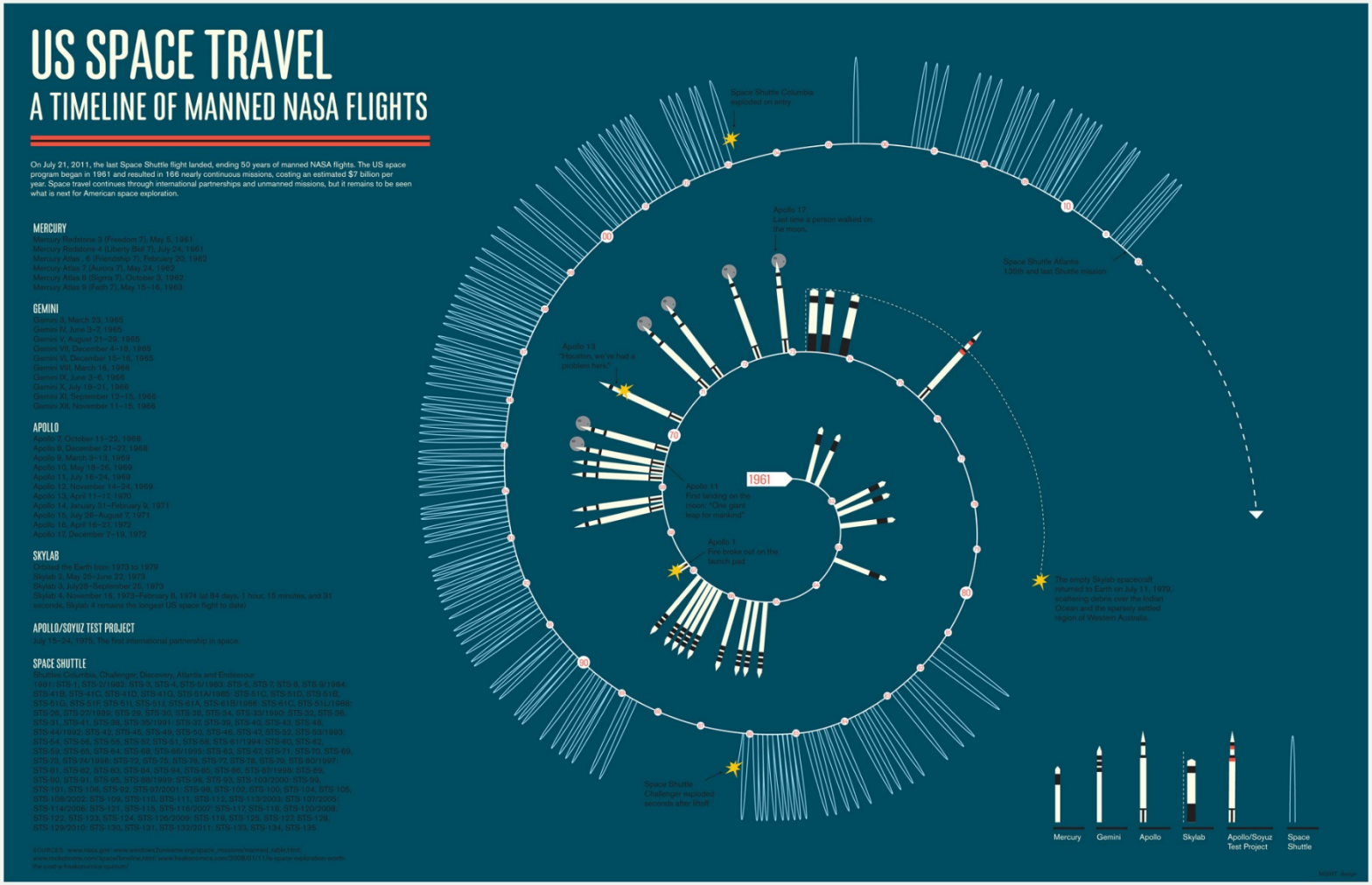


From Alberto Cairo, *The Functional Art*
Adaptation of Cleveland and McGill's scale from "Graphical Perception: Theory, Experimentation and Application to the Development of Graphical Methods," available at https://web.cs.dal.ca/~sbrooks/csci4166-6406/seminars/readings/Cleveland_GraphicalPerception_Science85.pdf

Elements of design

- Line
- Shape
- Value
- Color
- Texture
- Space
- Typography

Design elements – line



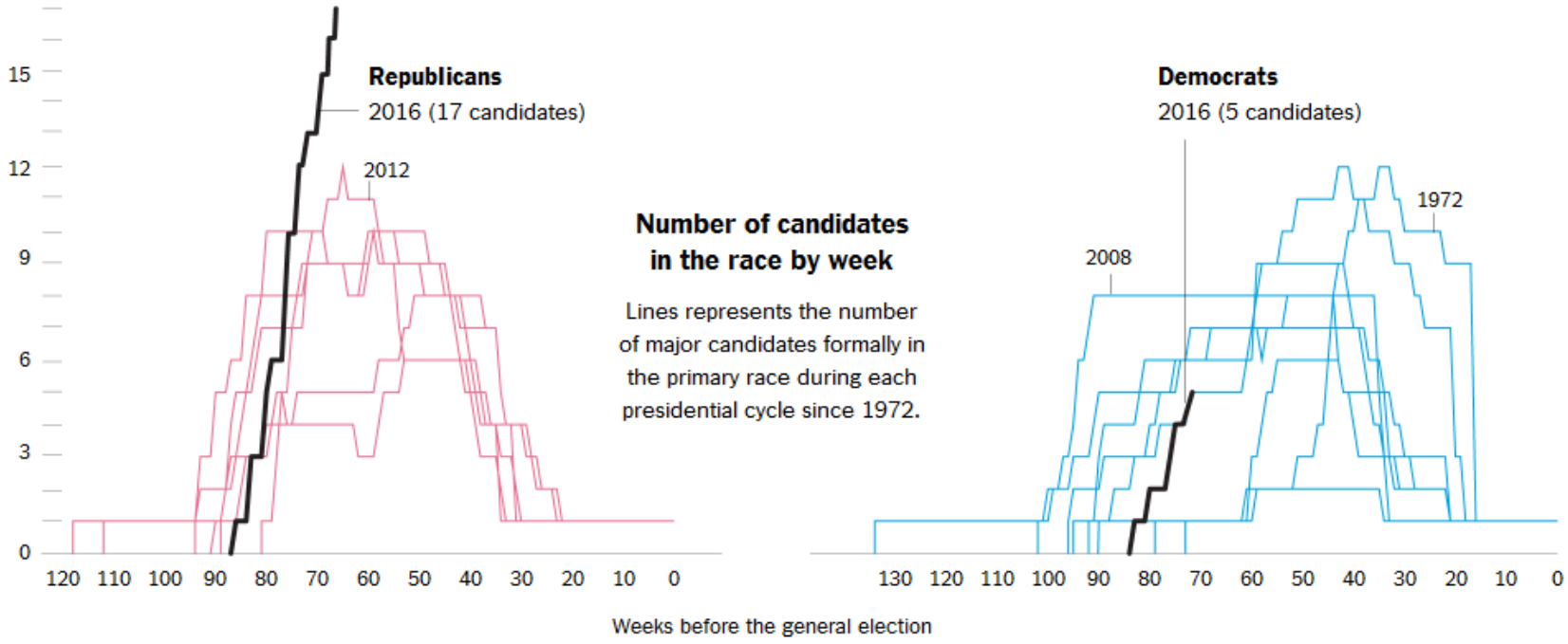
http://www.mgmtdesign.com/work.html?id=1,11,100

Line: passing of time

Stacking Up the Presidential Fields

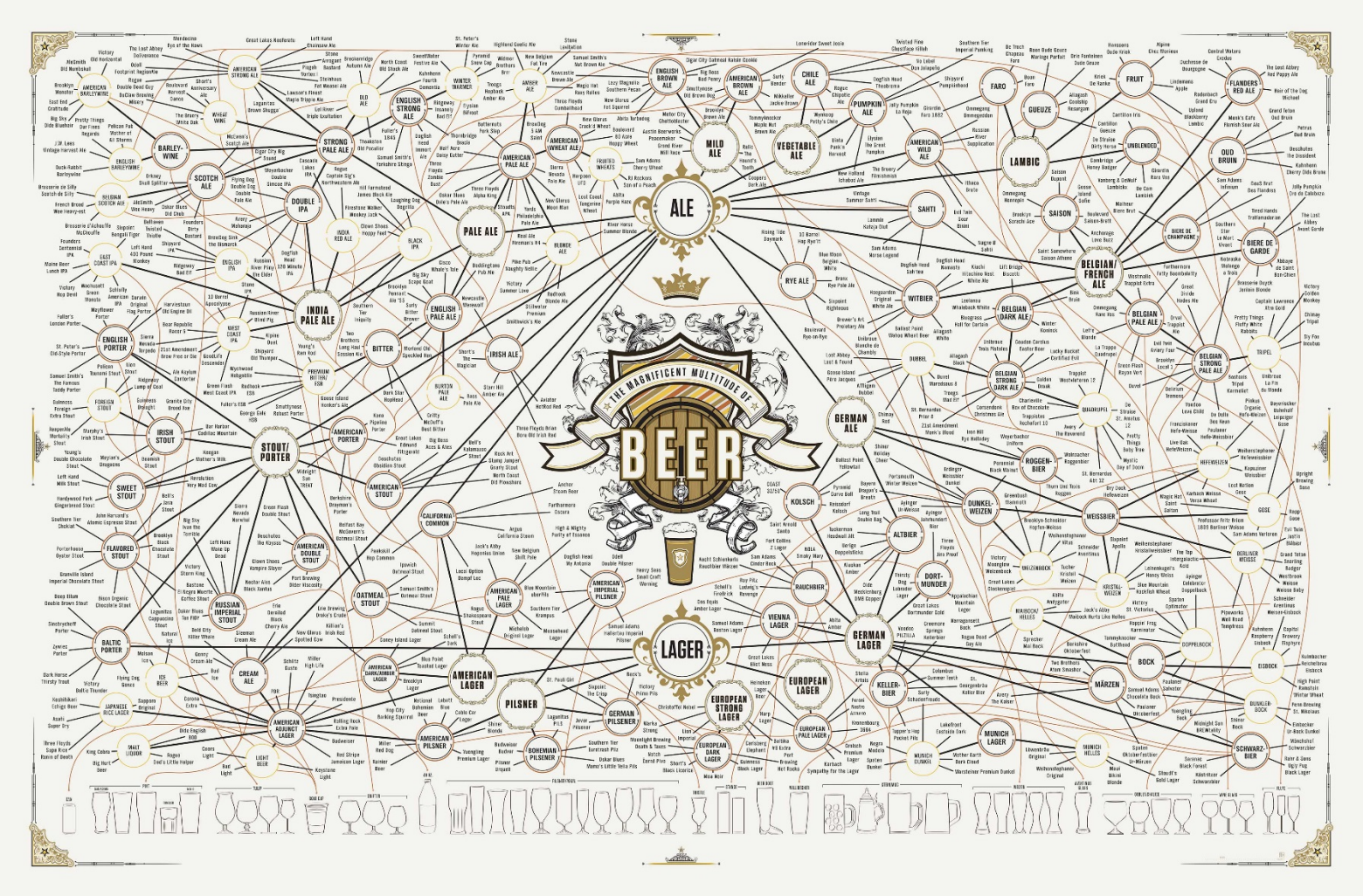
By ALICIA PARLAPIANO UPDATED AUGUST 3, 2015

The Republican party has 17 major presidential candidates this cycle — more than three times the number of Democrats and more than any other field in recent history. The charts below show the number of candidates in each field since 1972 (in years when there was no party incumbent) at any given week before the election.



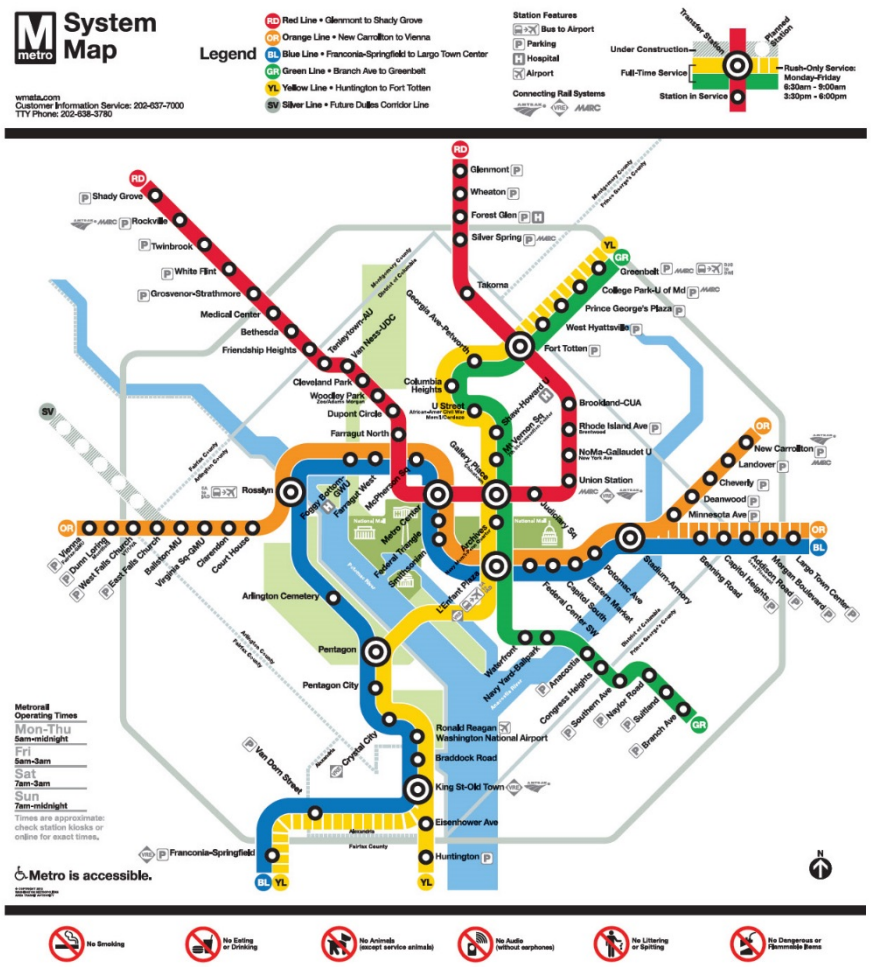
http://www.nytimes.com/interactive/2015/06/04/us/politics/stacking-up-the-presidential-fields.html

Line: relationships



http://popchartlab.com/products/the-magnificent-multitude-of-beer

Line: physical space

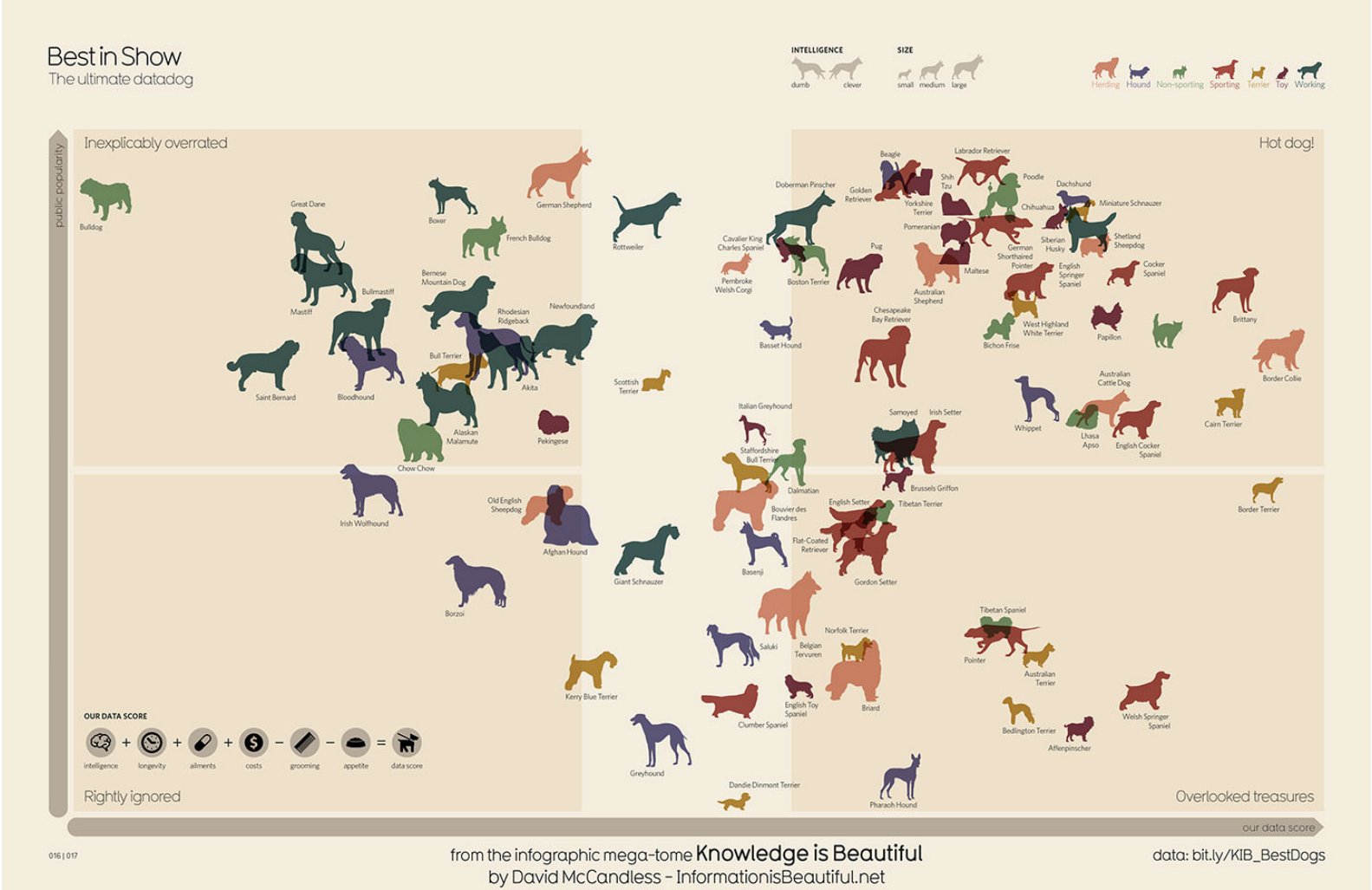


http://www.wmata.com

Design elements – shape

http://www.mgmtdesign.com/work.html?id=1,11,100

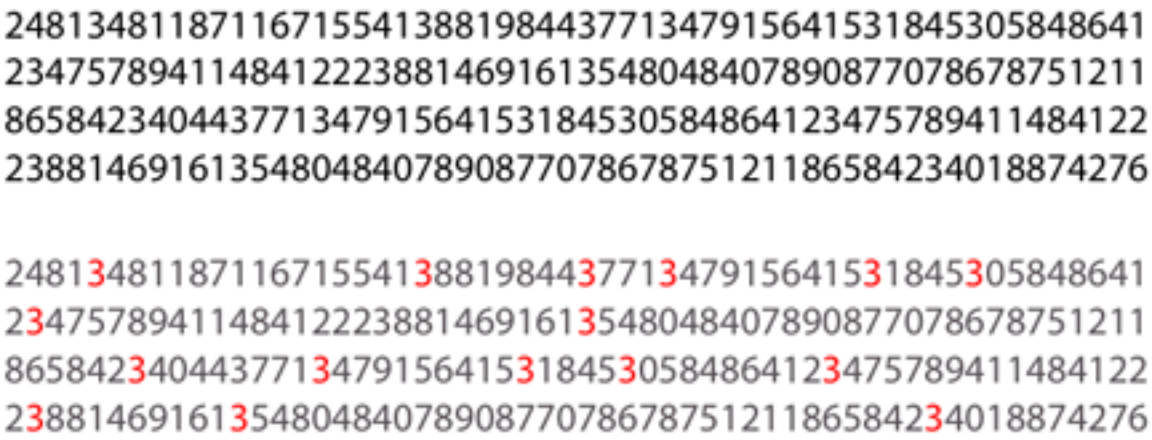
Shape: symbols as categories



from the infographic mega-tome **Knowledge is Beautiful**
by David McCandless - InformationisBeautiful.net

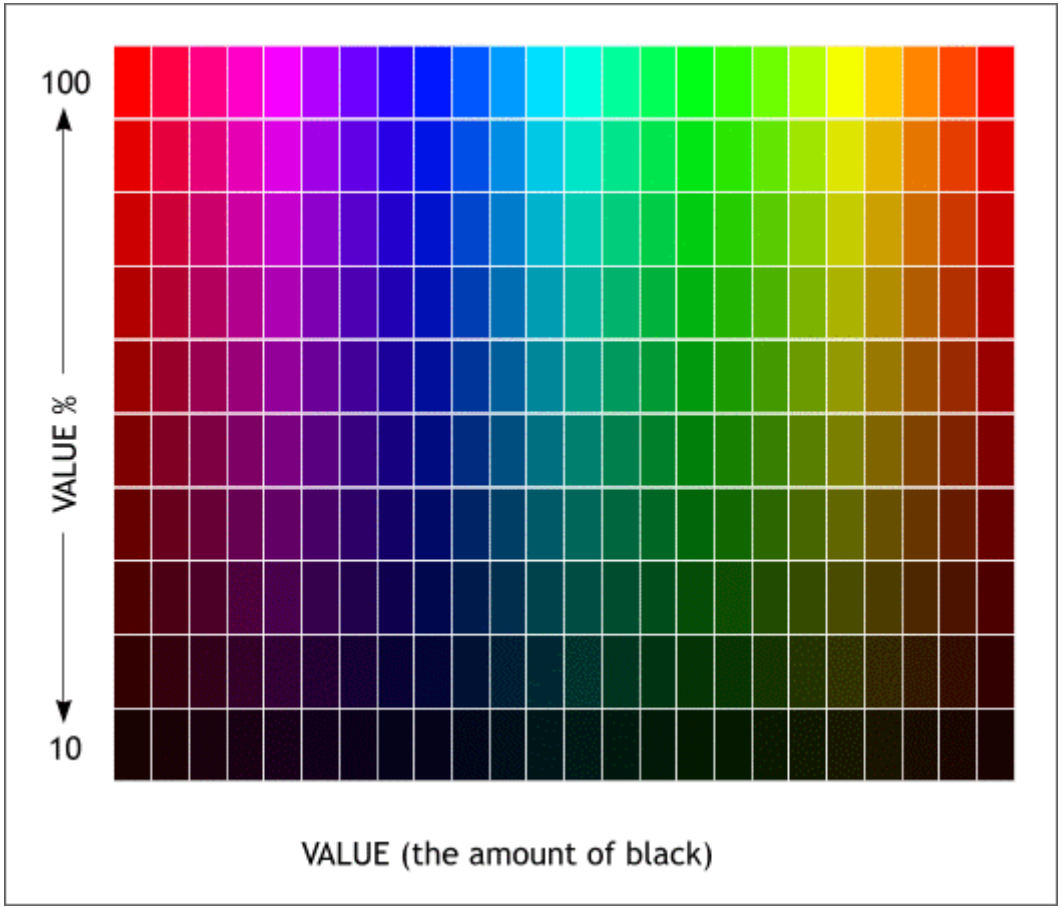
data: bit.ly/KIB_BestDogs

Caution: detecting shape variation



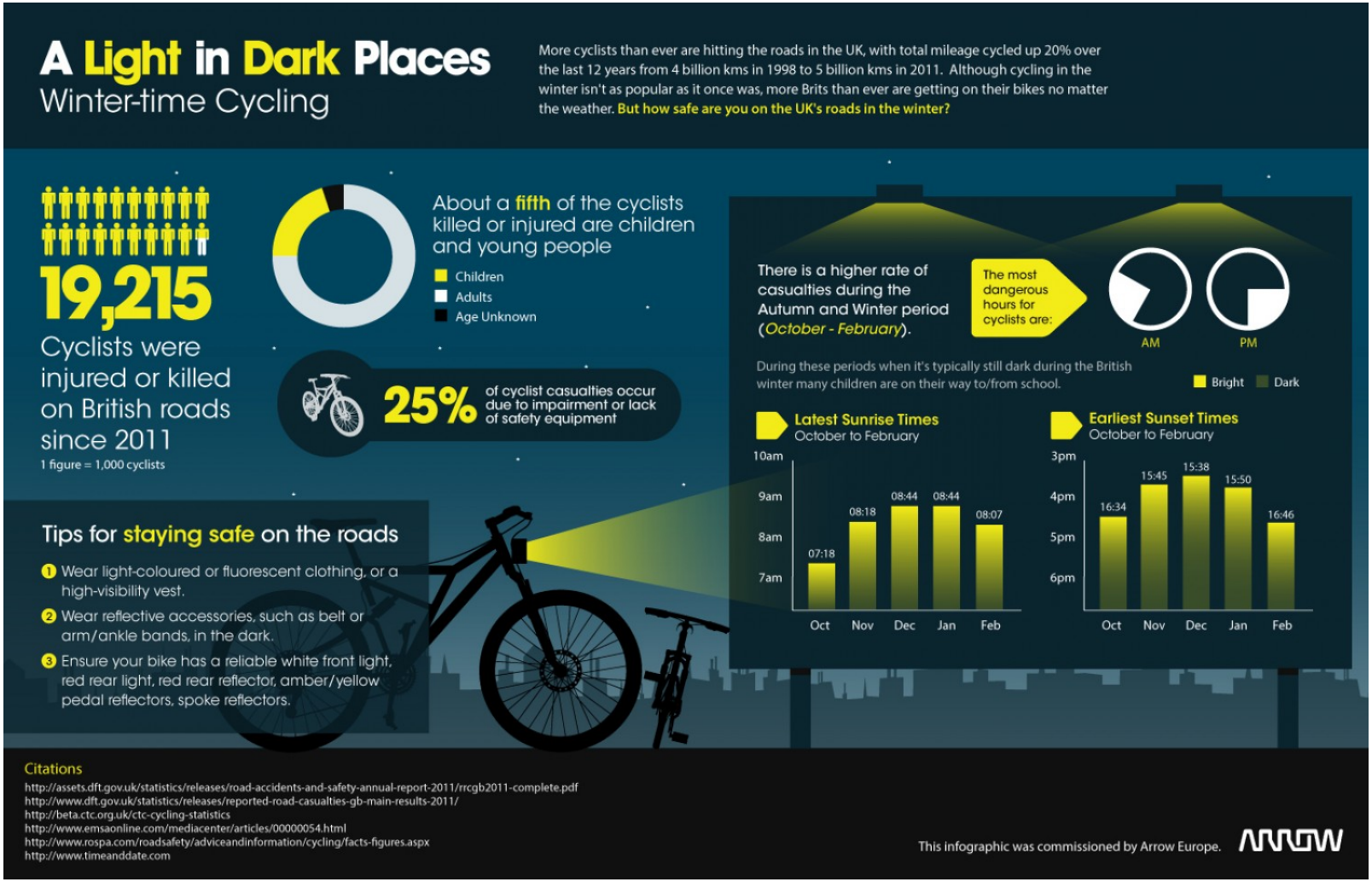
http://www.formulate.com.au/blog/perception-3-colour

Design elements – value



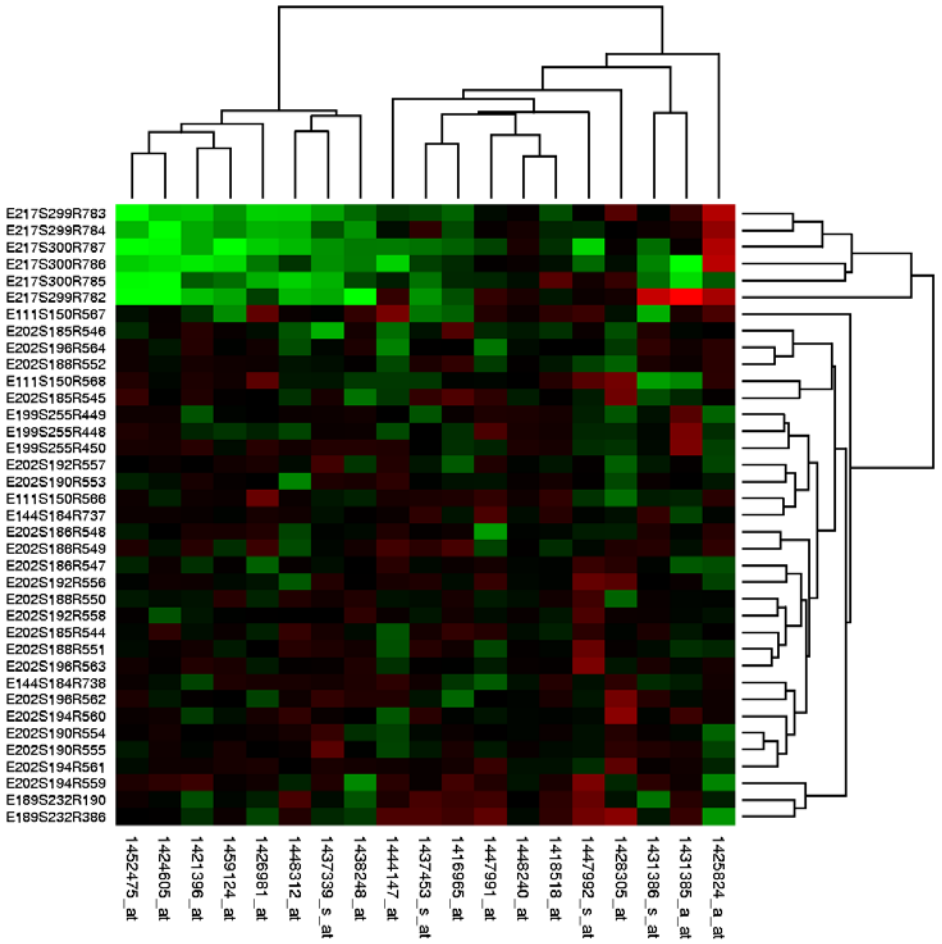
http://facweb.cs.depaul.edu/sgrais/color_value.htm

Value: emphasis and mood



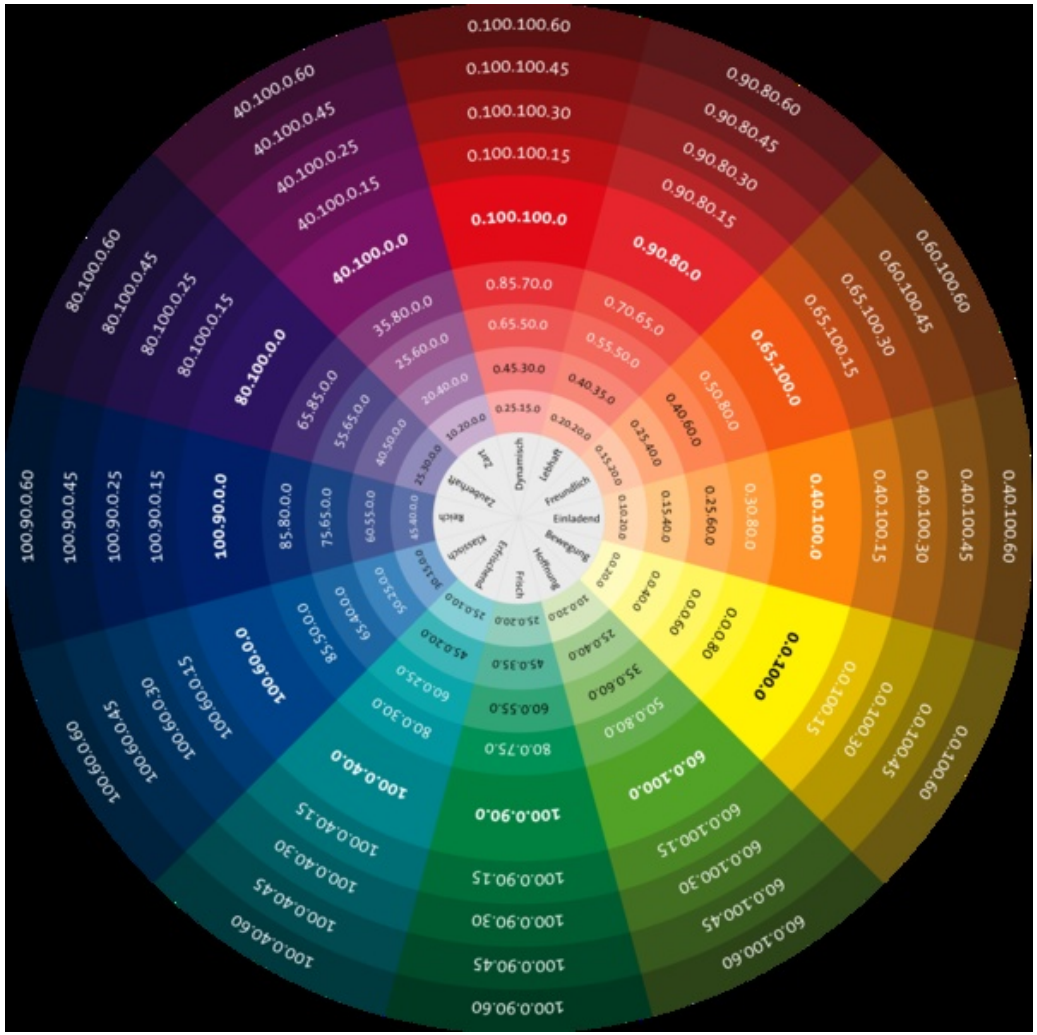
http://visual.ly/light-dark-places

Value: comparison



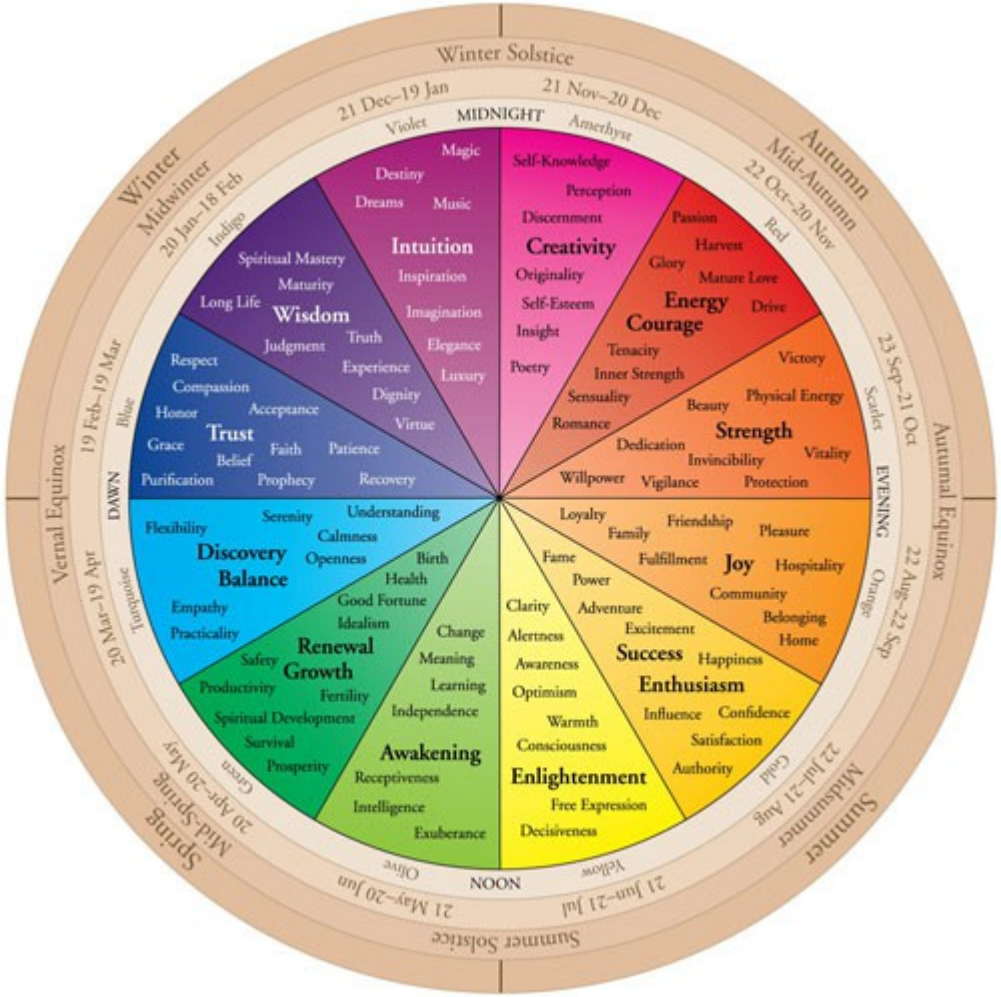
http://www.unibo.it/en/research/business-and-research/patents/2013/molecular-signature

Design elements: color



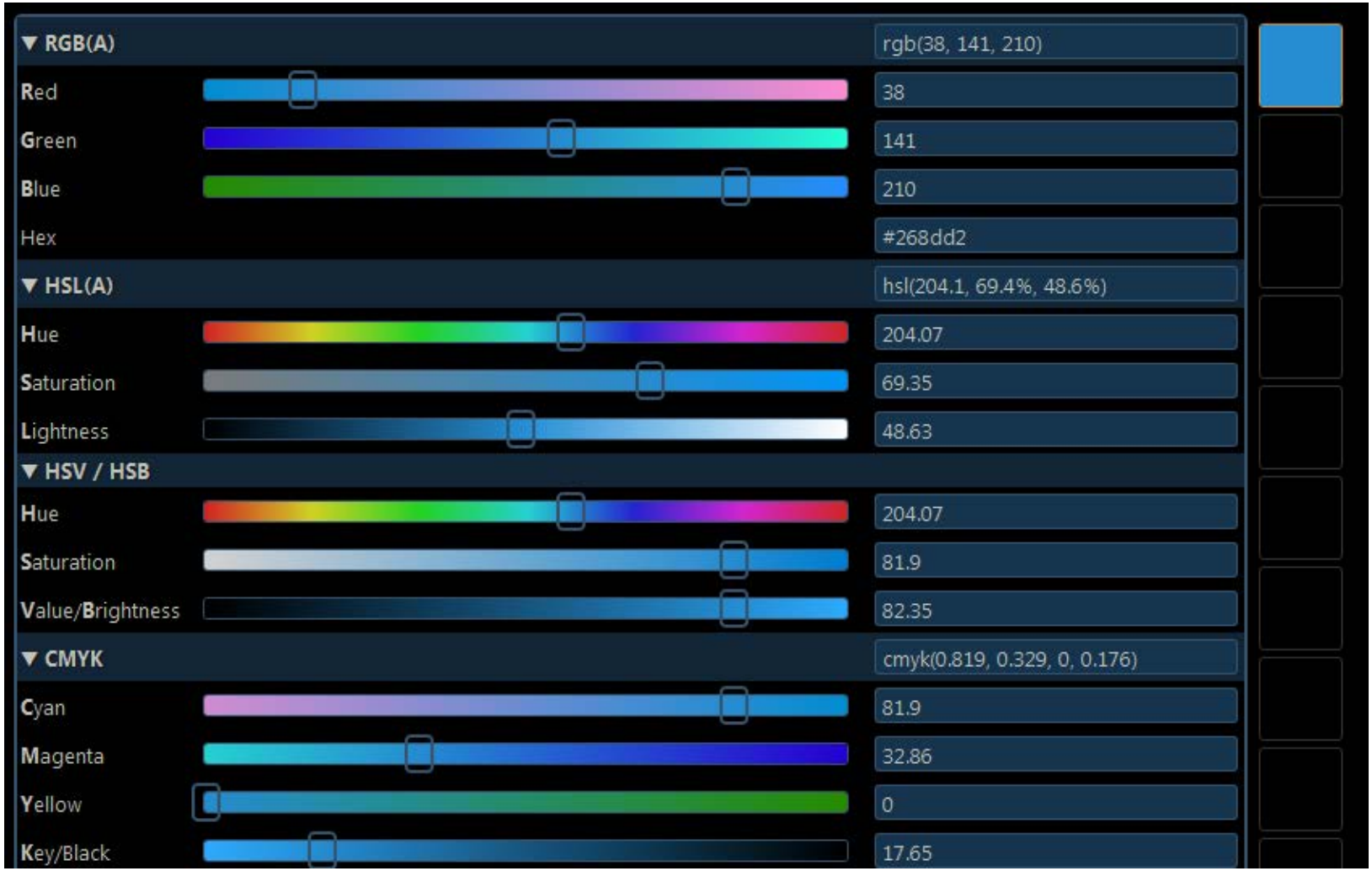
https://www.pinterest.com/pin/62909726019312969/

Color: mood



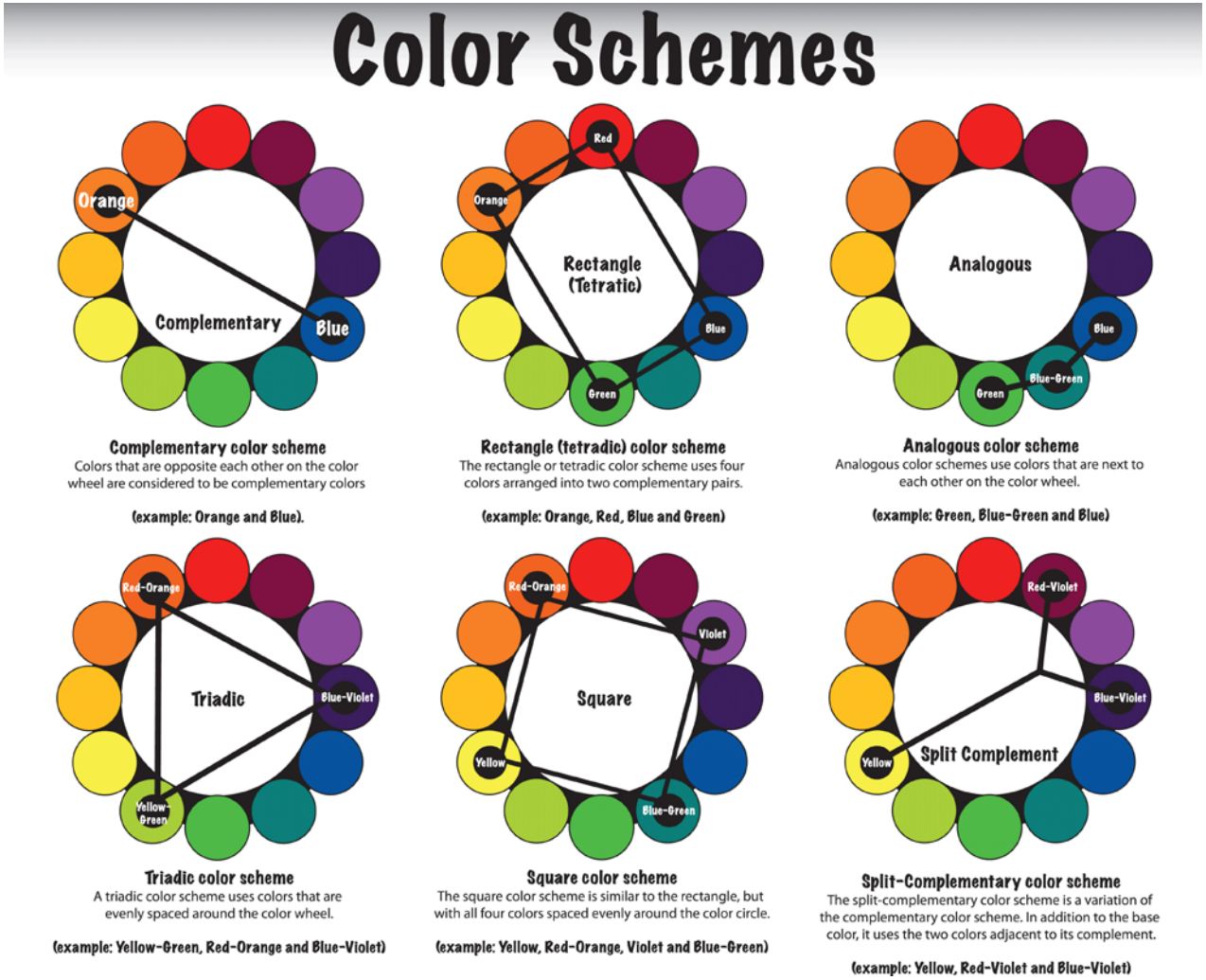
http://www.carlyjamison.com/2012/08/05/color-theory-wheel/

Describing color



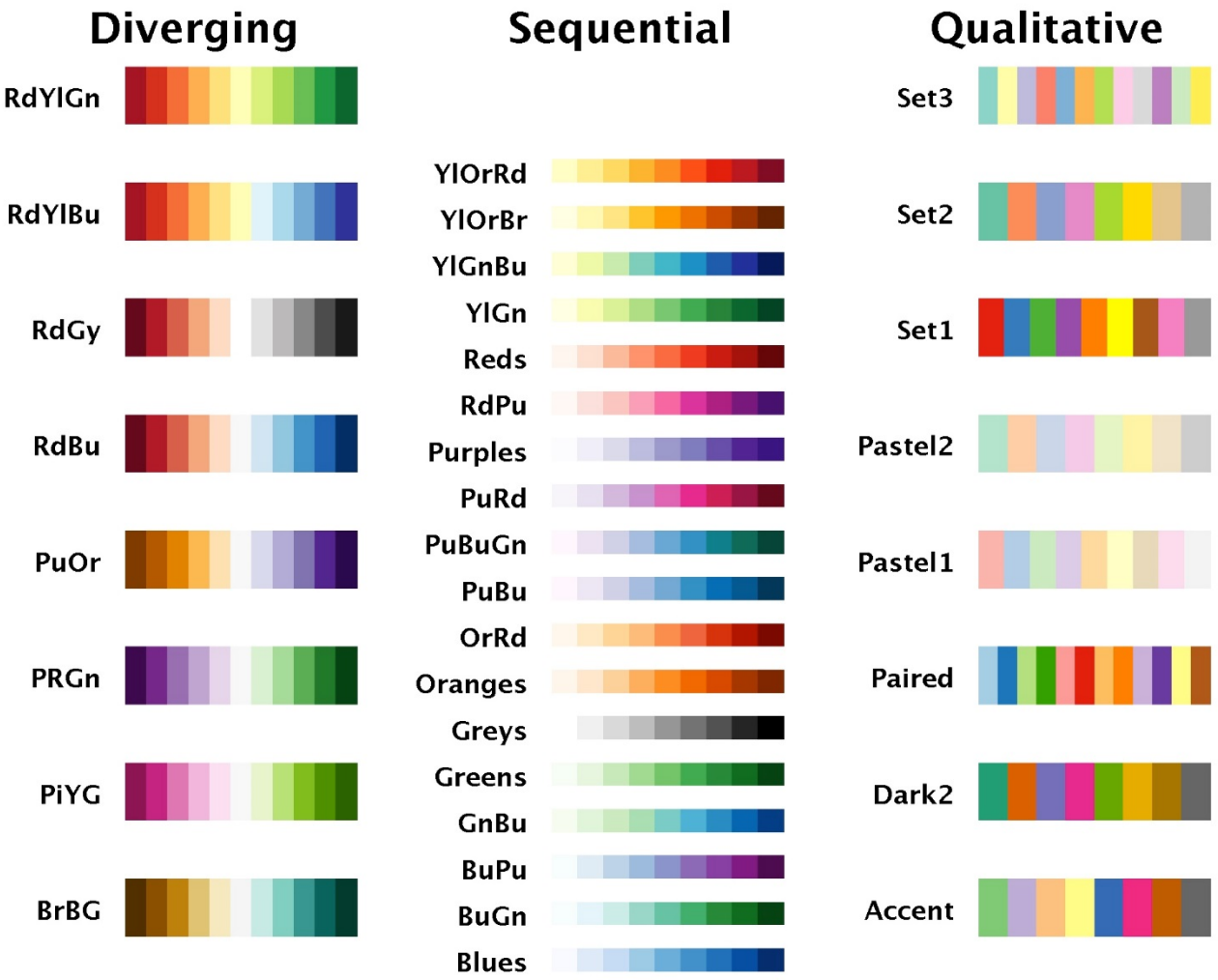
http://colorizer.org/

Color schemes



http://sunywcc2ddesign.com/project-5-color-schemes

Color palette types

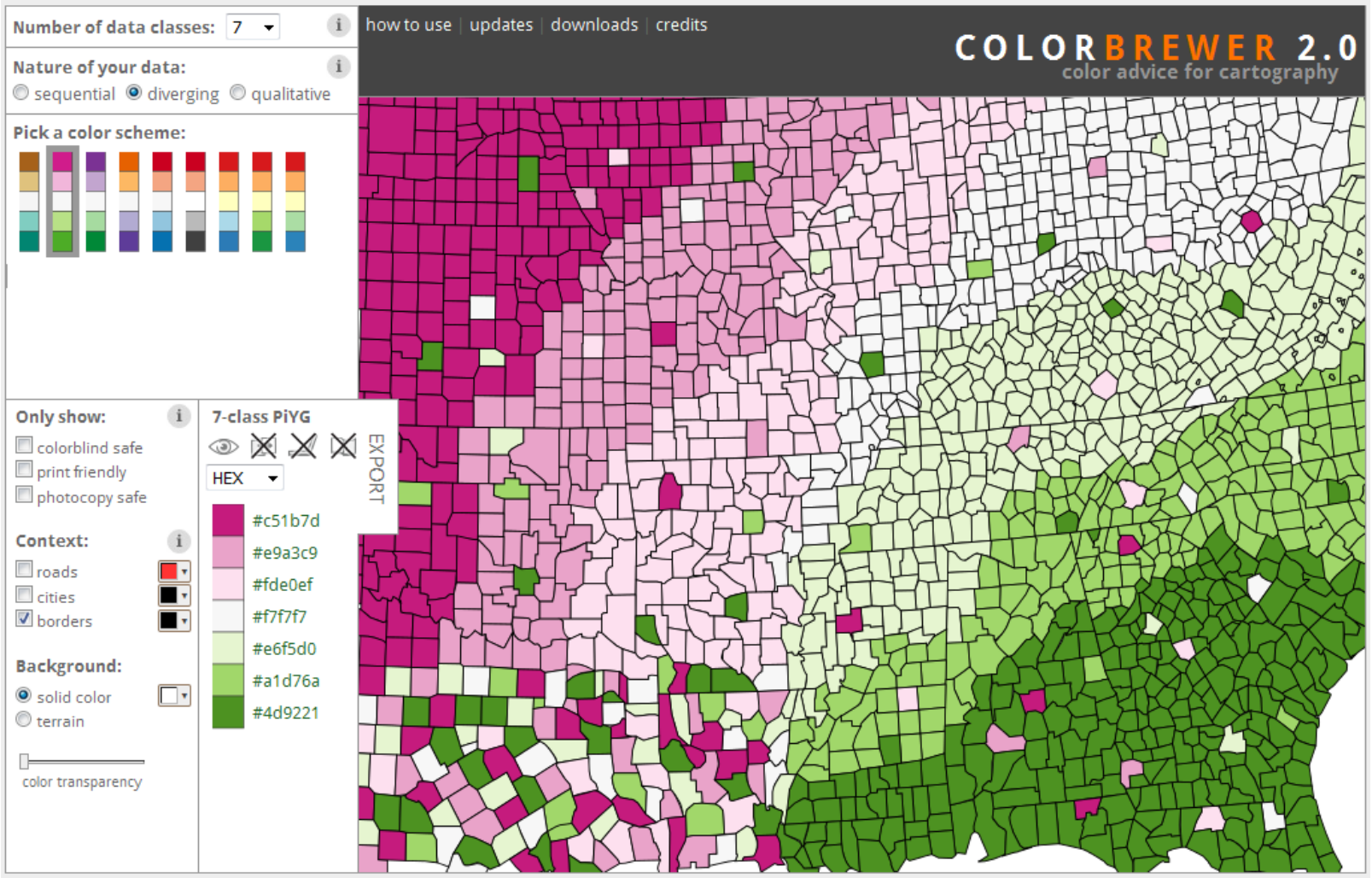


http://www.mathworks.com/matlabcentral/fileexchange/34087-cbrewer---colorbrewer-schemes-for-matlab/content/cbrewer/cbrewer.m

Cool tool: Paletton

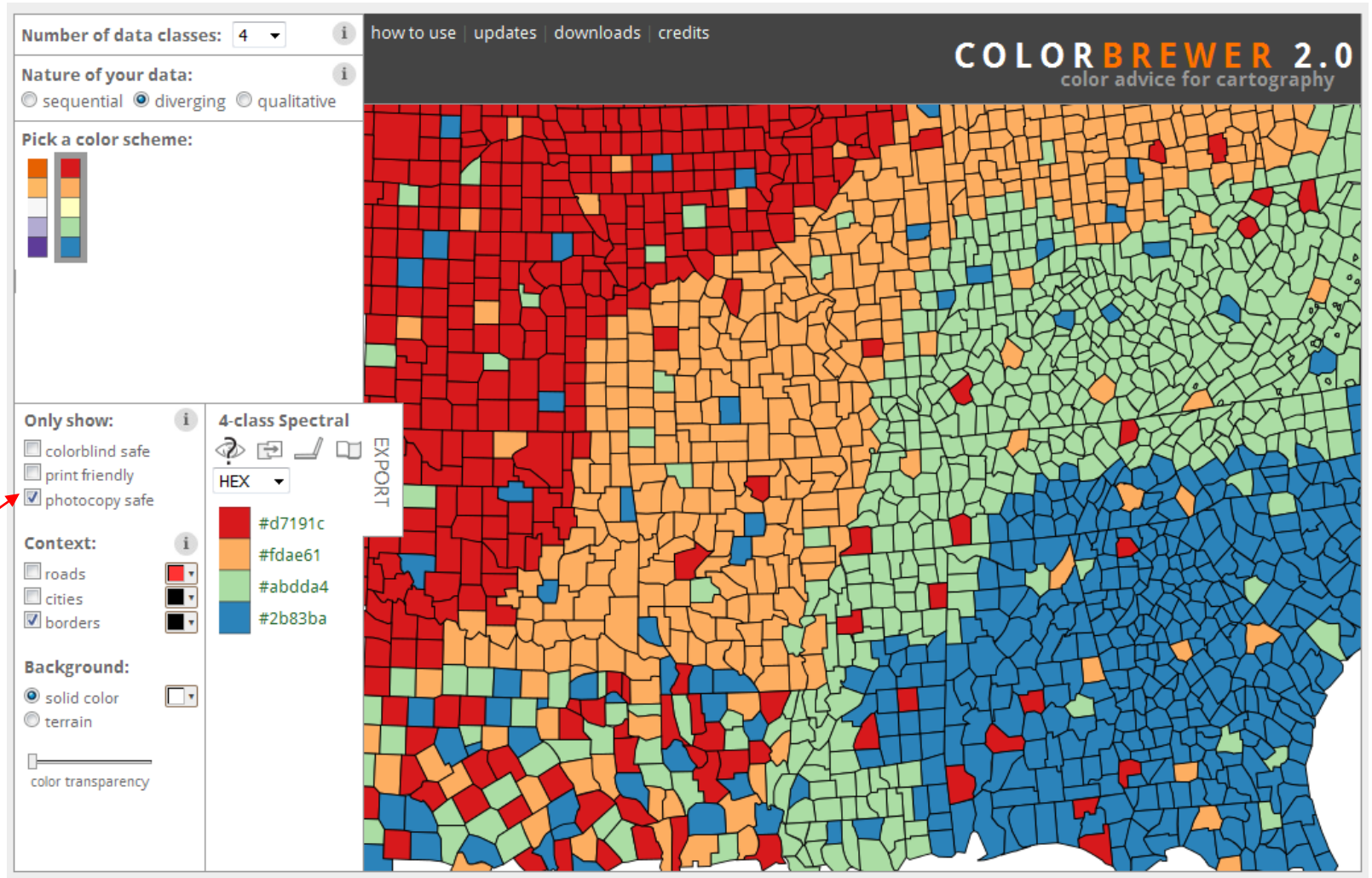
http://paletton.com/

Cool tool: Color Brewer

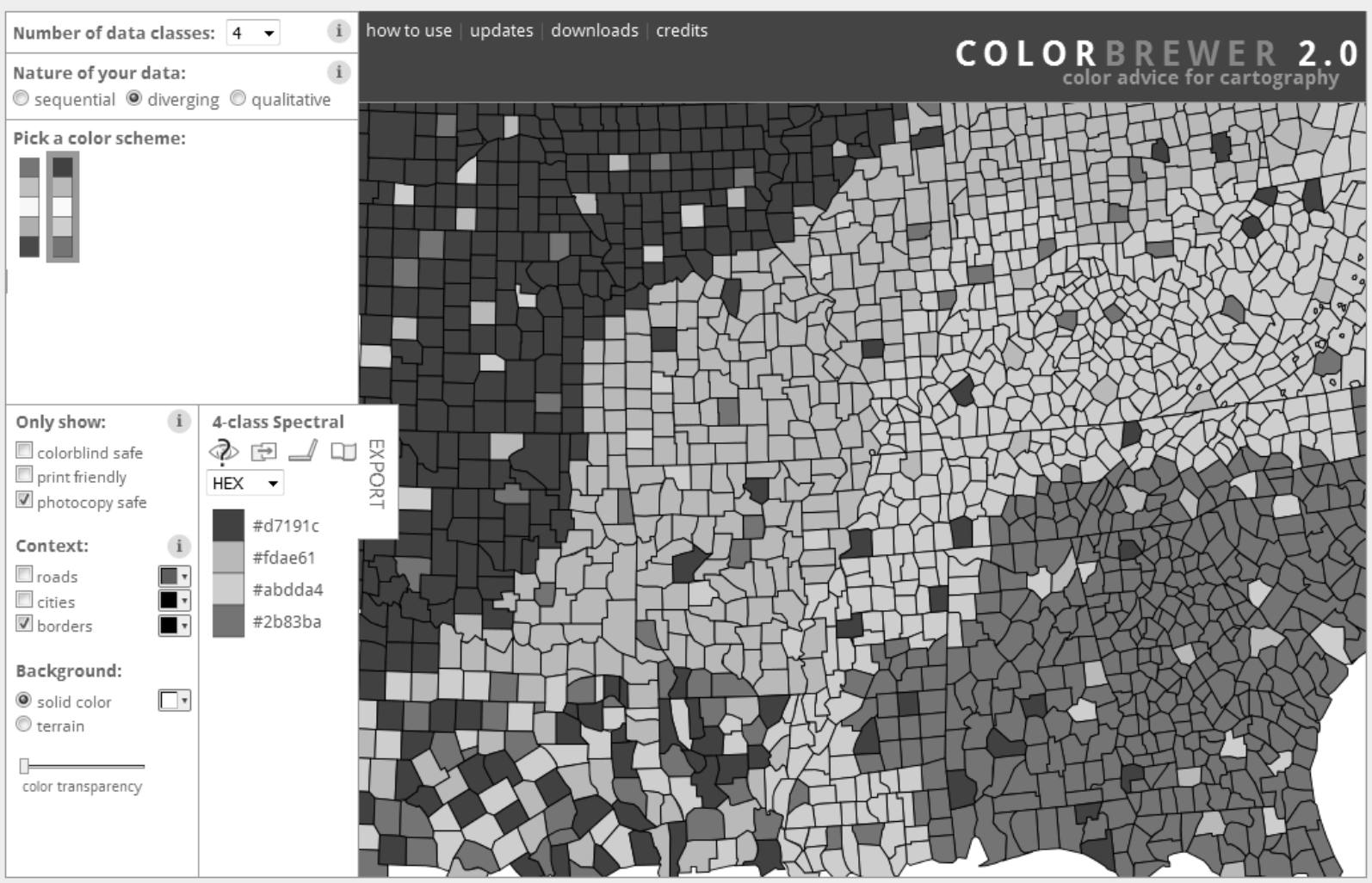


http://colorbrewer2.org/

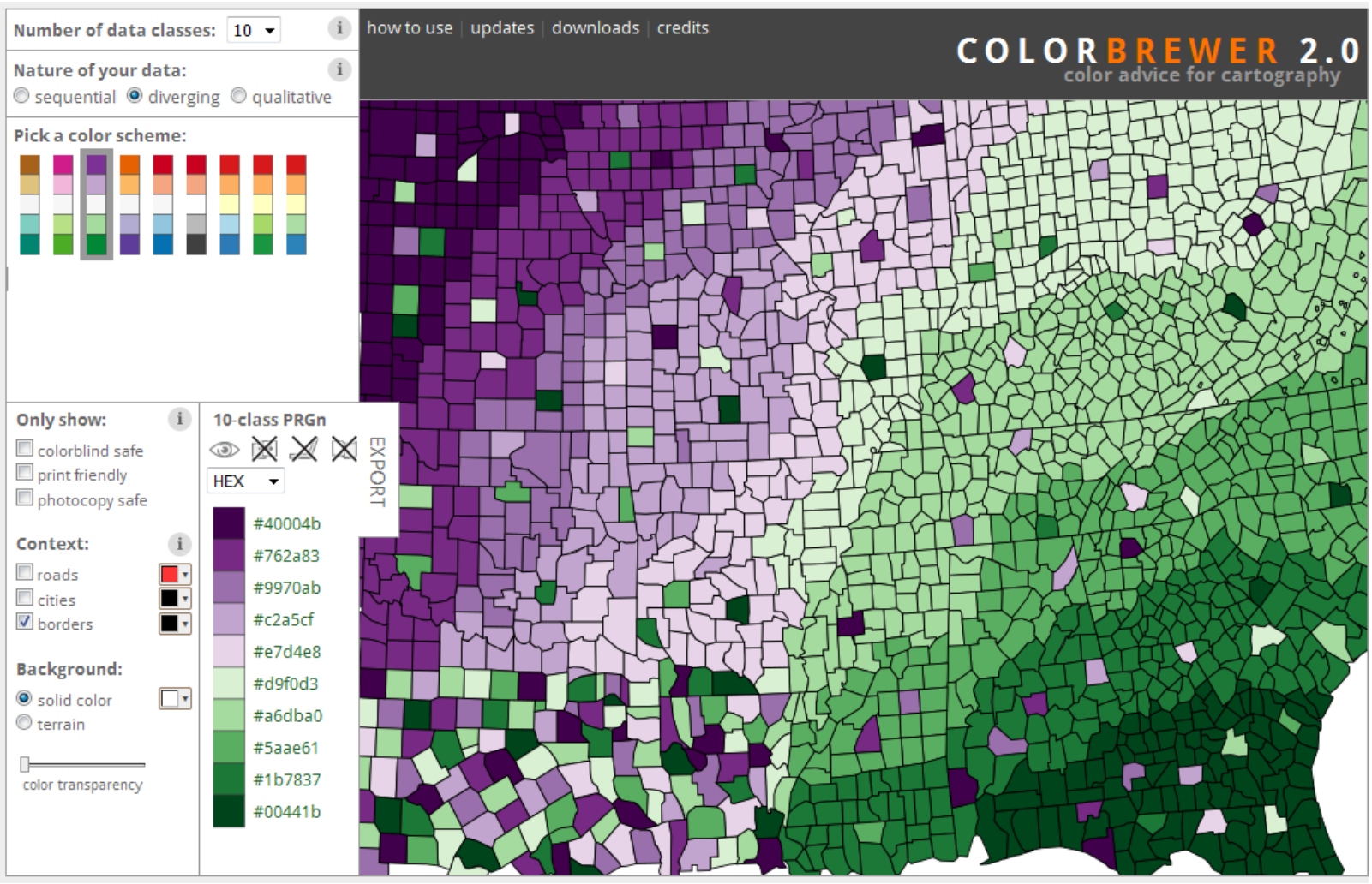
Greyscale


Number of data classes: 4
Nature of your data:
sequential diverging qualitative
Pick a color scheme:
how to use | updates | downloads | credits
COLORBREWER 2.0
color advice for cartography
Only show:
colorblind safe
print friendly
photocopy safe
Context:
roads
cities
borders
Background:
solid color
terrain
color transparency
4-class Spectral
EXPORT
HEX
#d7191c
#fdae61
#abdda4
#2b83ba

Greyscale – works

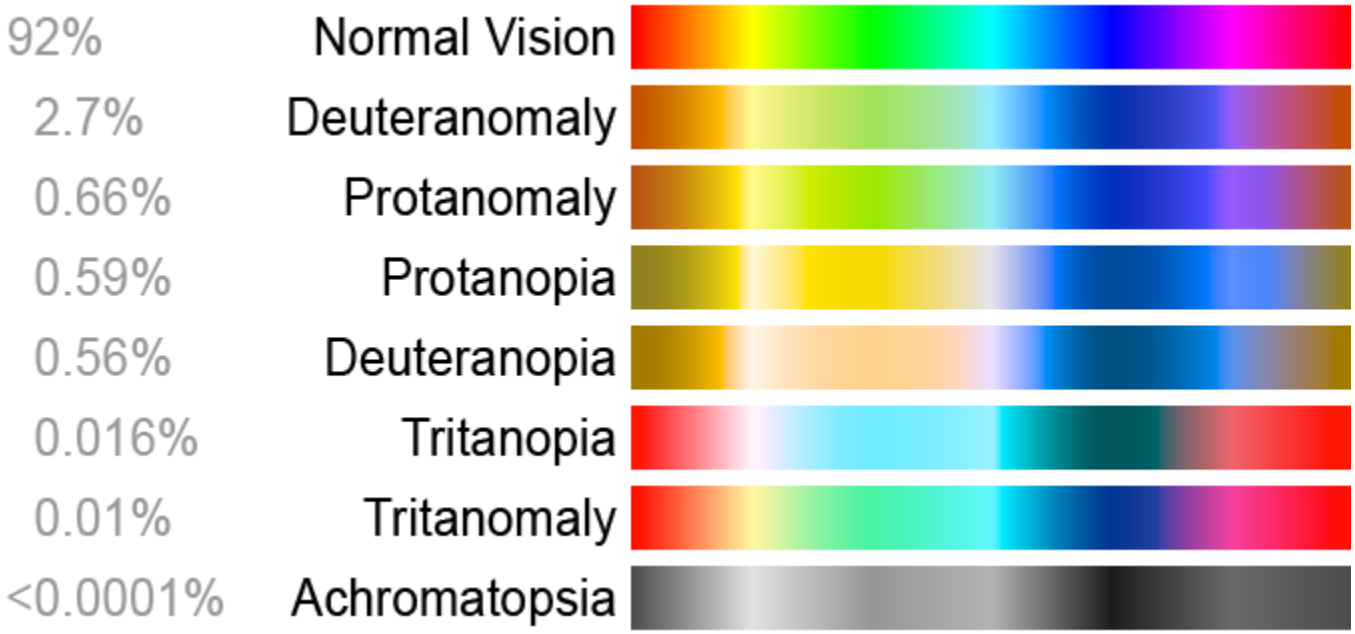


Greyscale: doesn't work!



http://colorbrewer2.org/

Color blindness



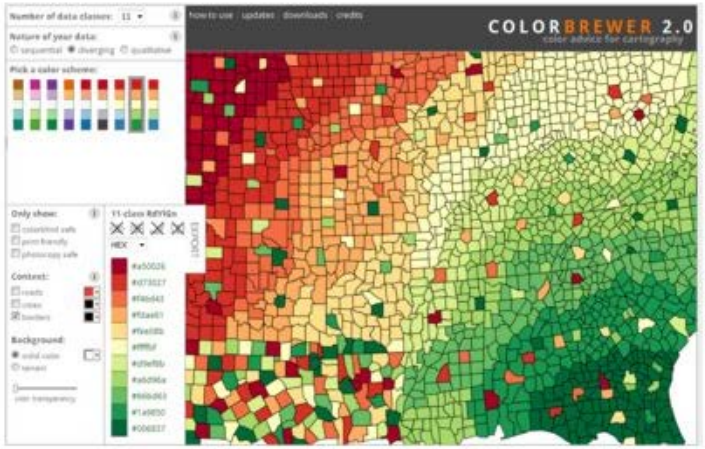
https://plus.google.com/+HermanWillems/posts

Cool tool: Vischeck

Try Vischeck on Your Image Files

Your Results:

Original Image



Deuteranope Simulation

Select the type of color vision to simulate:

(•) Deuteranope (a form of red/green color deficit)

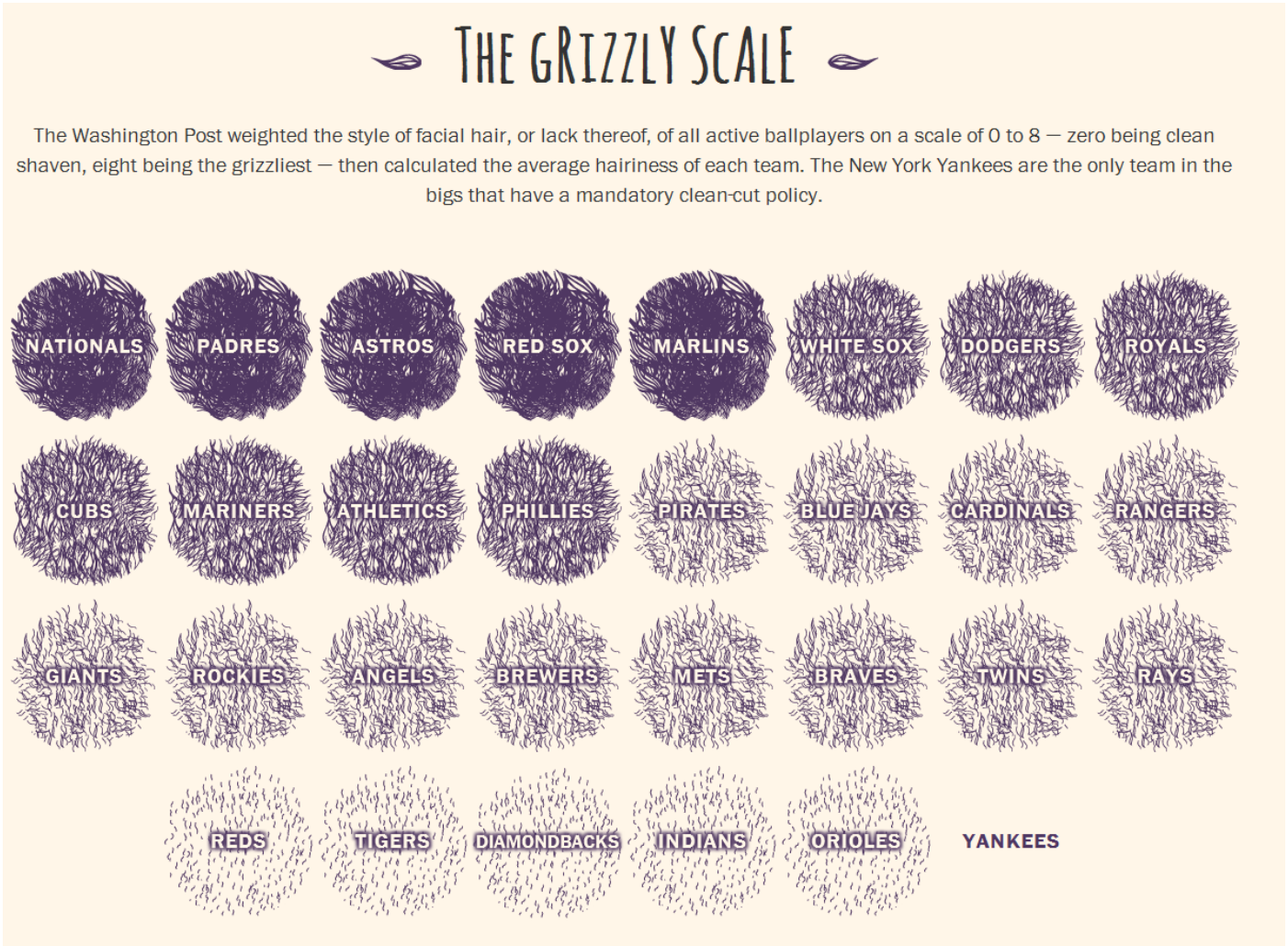
( ) Protanope (another form of red/green color deficit)

( ) Tritanope (a blue/yellow deficit- very rare)

Image file: [Browse...] No file selected. [Run Vischeck!]

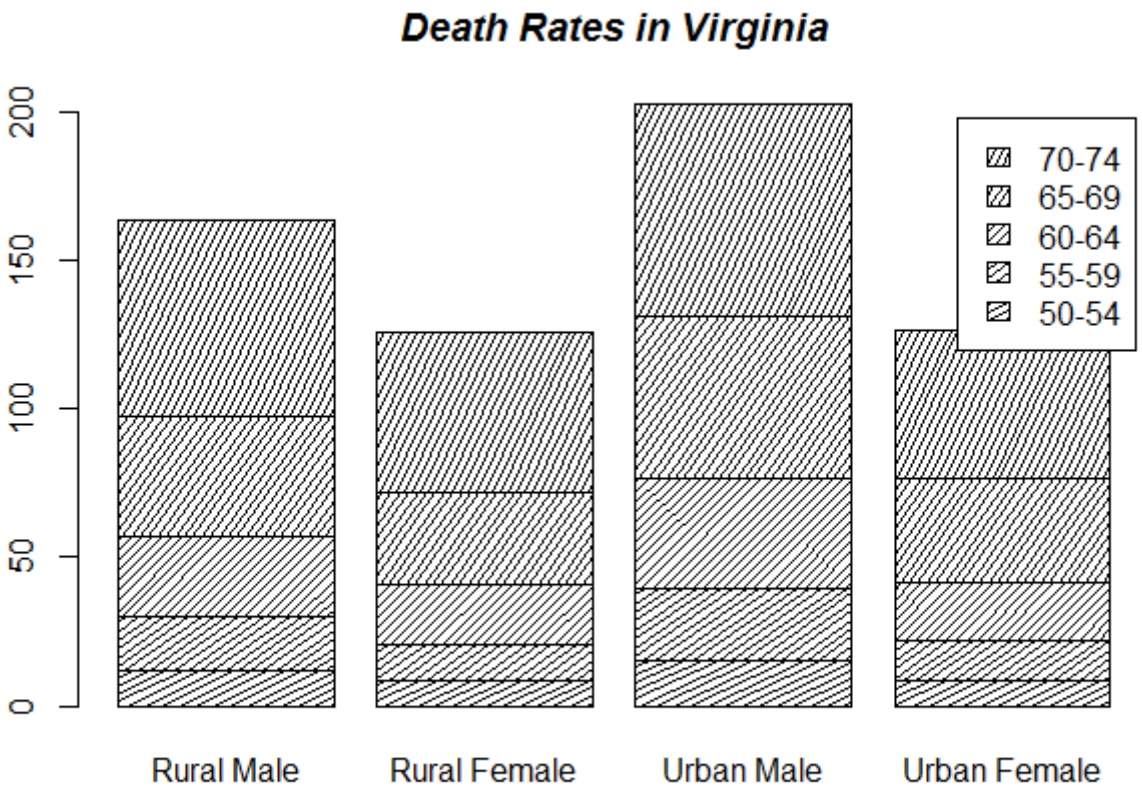
http://www.vischeck.com/vischeck/

Design elements: texture



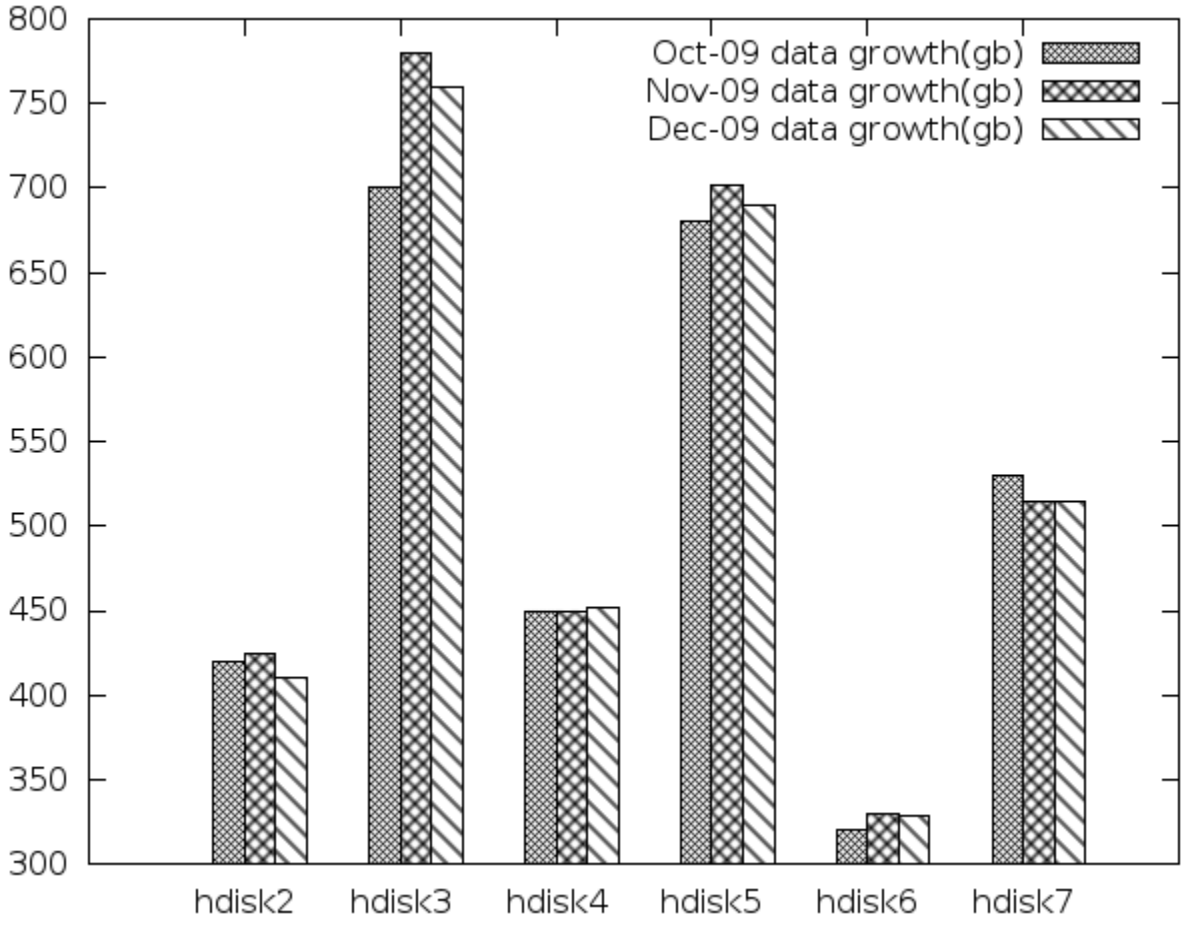
http://apps.washingtonpost.com/f/beards/

Texture: difference (not so well done)



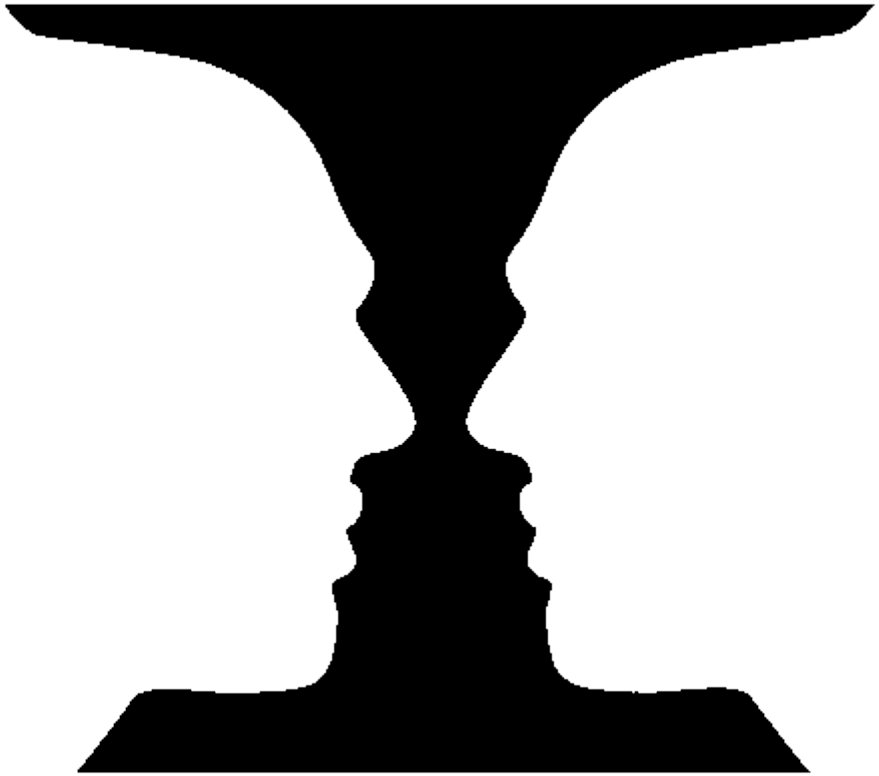
http://stackoverflow.com/questions/30193799/how-to-fill-stacked-barplot-with-patterns-or-textures-in-r

Texture: difference (better)



http://stackoverflow.com/questions/28782380/distinct-bars-of-different-group-in-gnuplot-for-printing

Design elements: space



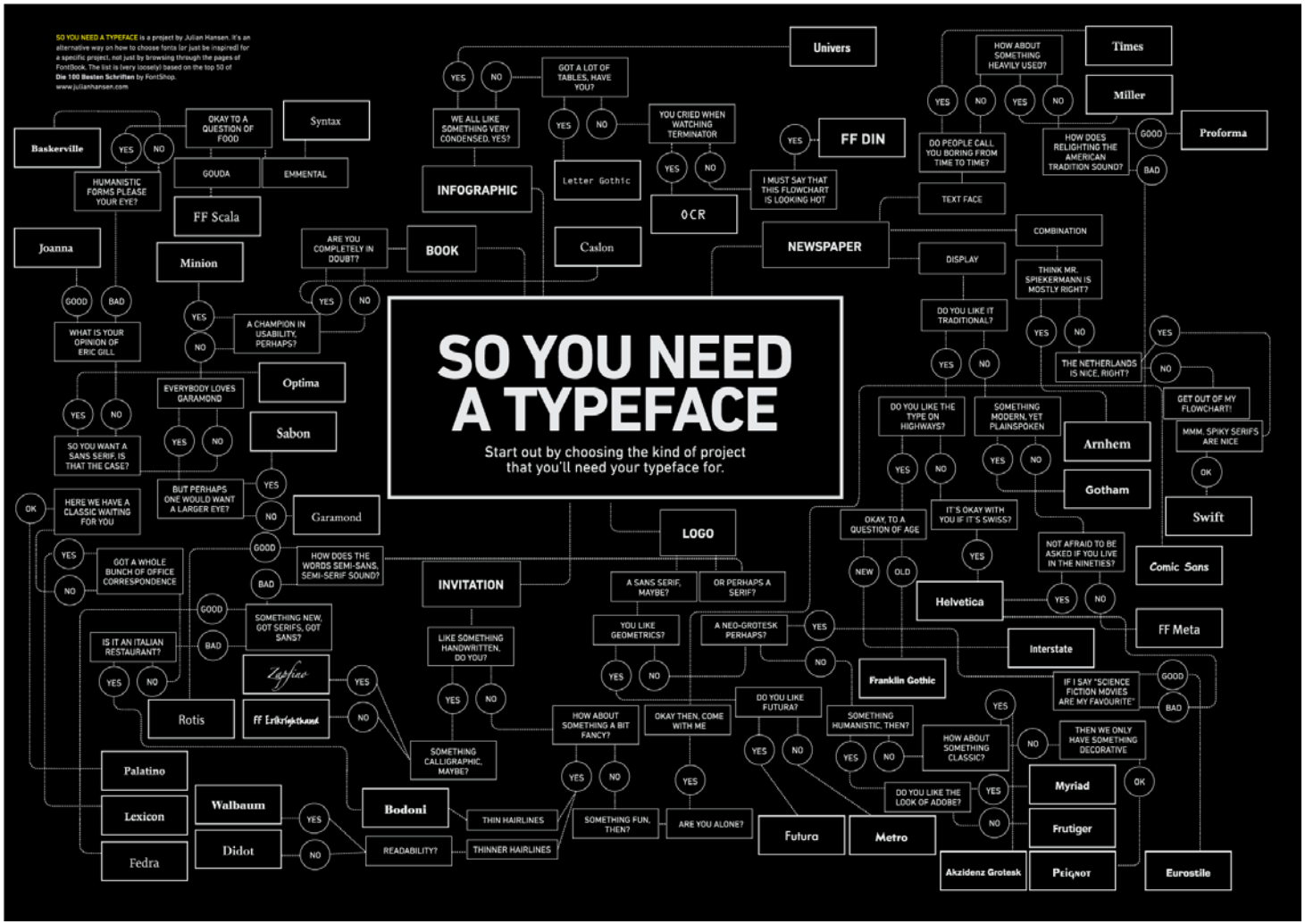
http://infohost.nmt.edu/~armiller/illusion/cupface.htm

Space: defining flow

Space: how much?

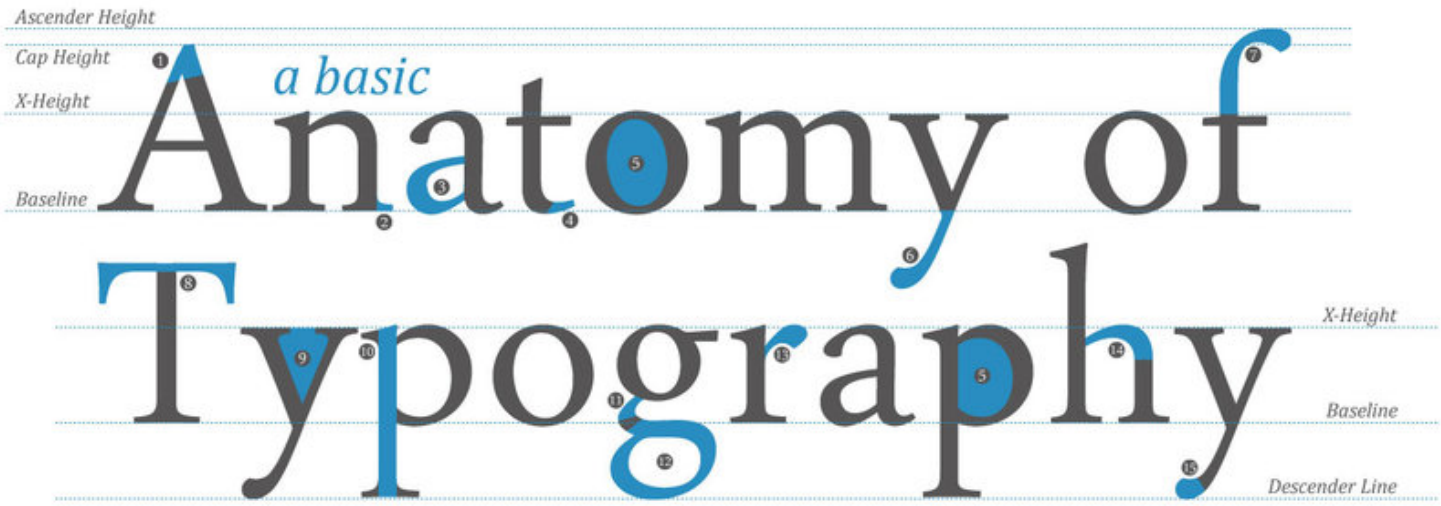
http://infografistas.blogspot.com/2010_06_01_archive.html

Design elements: typography



http://julianhansen.com/

Typography basics



Typefaces, like most things, are made up of constituent parts. The characteristics of these parts give typefaces their character.

1. Apex
2. Serif
3. Bowl
4. Finial
5. Counter
6. Descender
7. Ascender
8. Bar
9. Open-counter
10. Stem
11. Link
12. Loop
13. Ear
14. Shoulder
15. Tail

Yoeri Hokken

http://typostrate.com/post/84910109490/the-anatomy-of-type

Serif or sans serif?

Serifs are the small lines tailing from the edges of letters and symbols, separated into distinct units for a typewriter or typsetter

Sans-serif is a typeface that does not have the small projecting features called "serifs" at the end of strokes.

Serif fonts are easier to read in printed works

This is because the serif make the individual letters more distinctive and easier for our brains to recognise quickly. Without the serif, the brain has to spend longer identifying the letter because the shape is less distinctive.

Sans serif fonts are better on the web

An important exception must be made for the web. Printed works generally have a resolution of at least 1,000 dots per inch; whereas, computer monitors are typically around 100 dots per inch.

http://www.webdesignerdepot.com/2013/03/serif-vs-sans-the-final-battle/

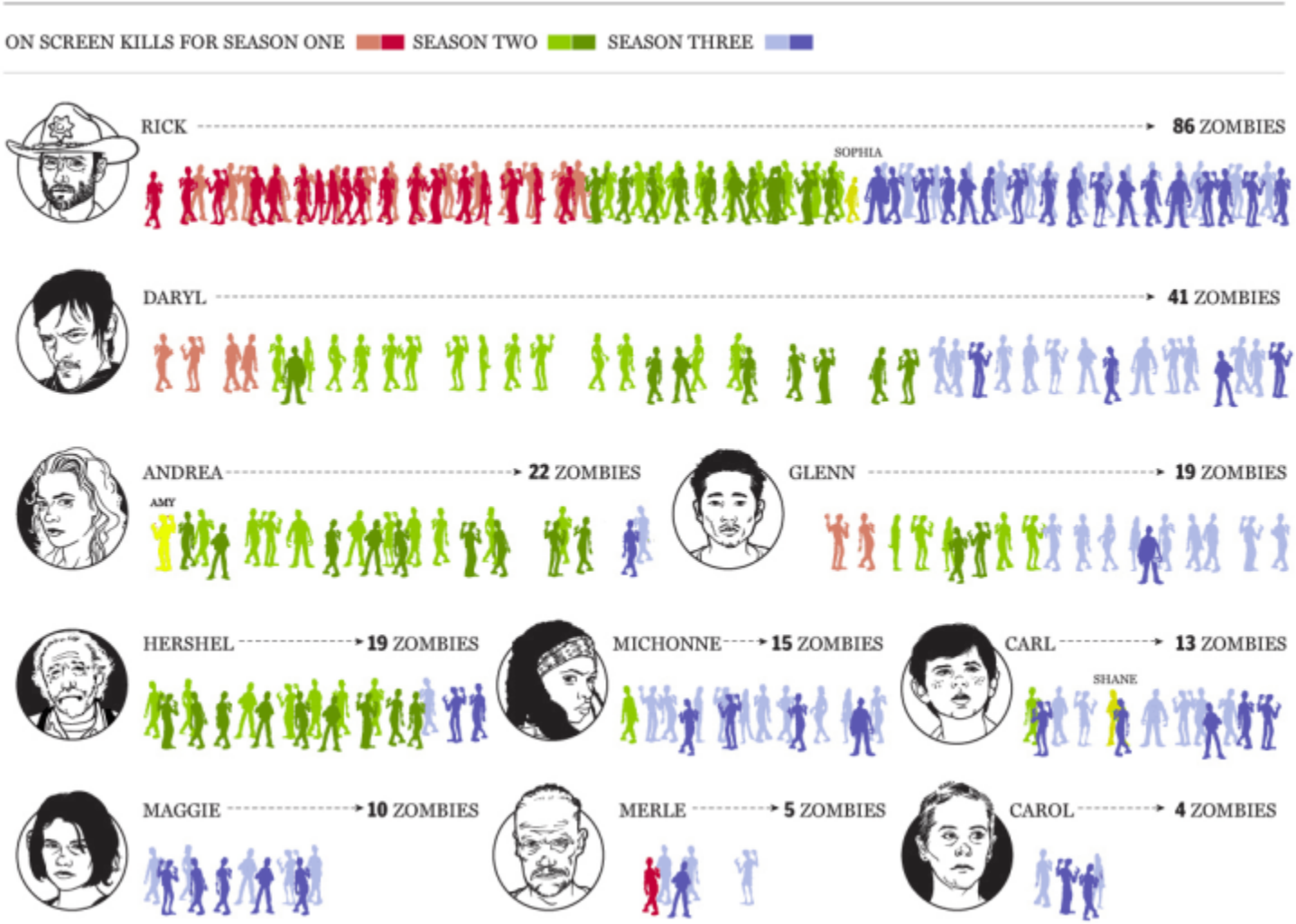
Tips for choosing fonts

http://superdevresources.com/making-font-combinations-that-work-infographics/

The principles of design

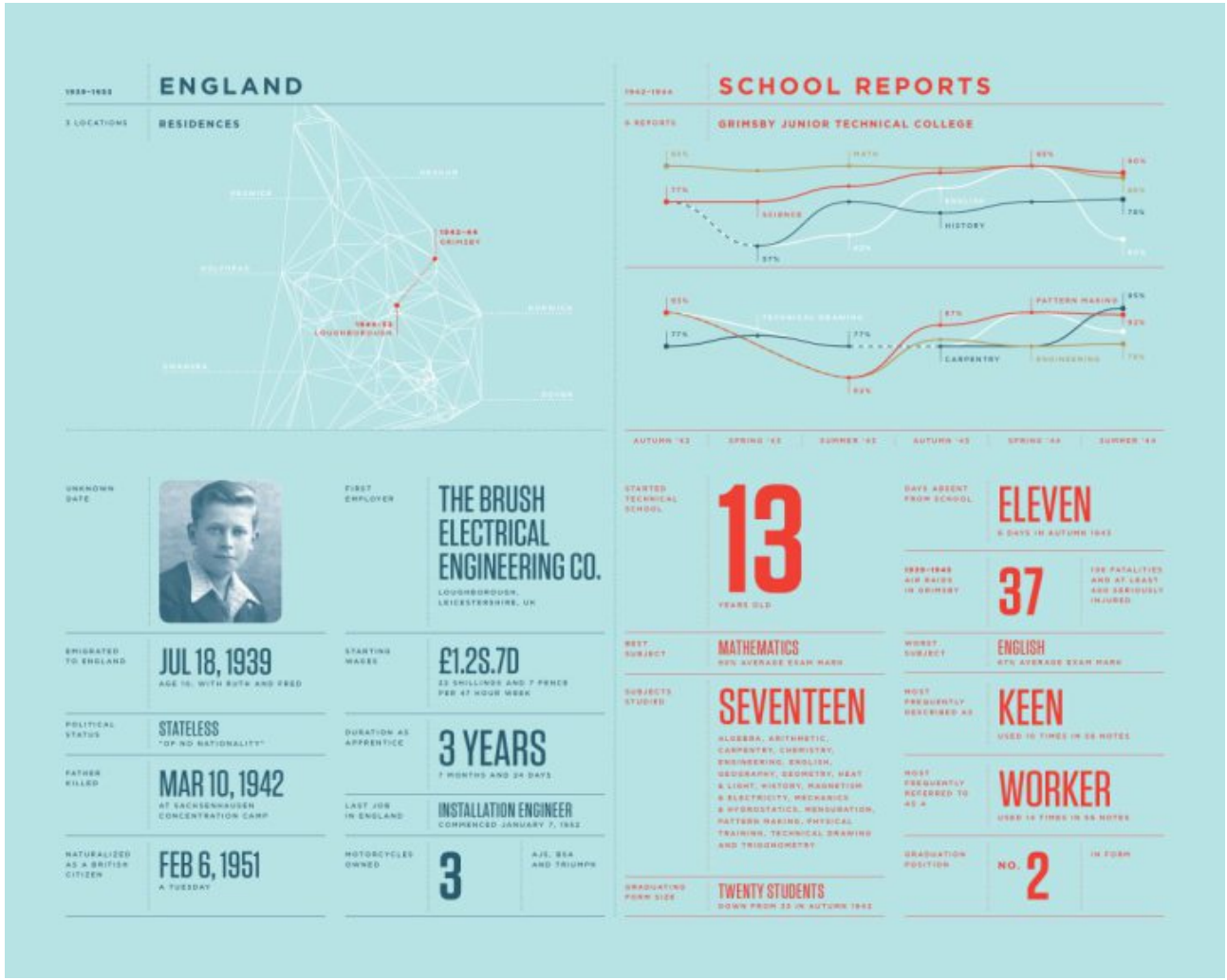
- Unity
- Balance
- Hierarchy
- Repetition
- Contrast
- Proximity

Unity



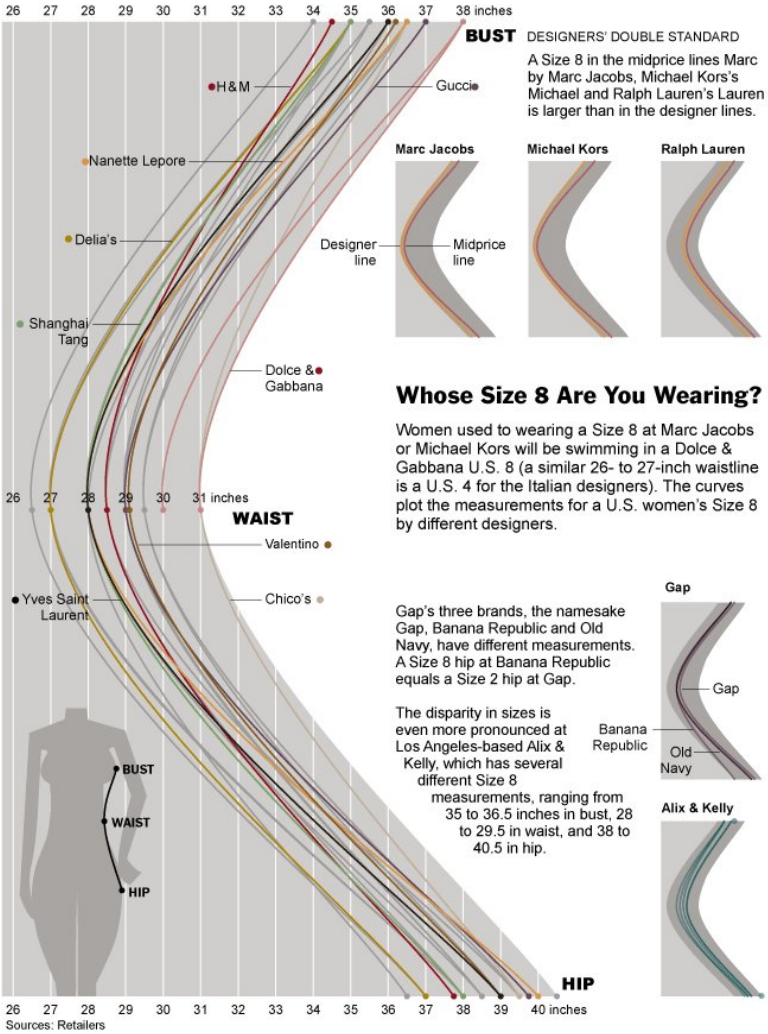
http://news.nationalpost.com/news/graphics/graphic-stopping-the-dead-a-statistical-look-back-at-the-walking-dead-series-so-far

Balance: symmetrical



http://flowingdata.com/2011/02/07/annual-feltron-report-is-up-this-time-with-dad/

Balance: asymmetrical



http://www.nytimes.com/2011/04/25/business/25sizing.html

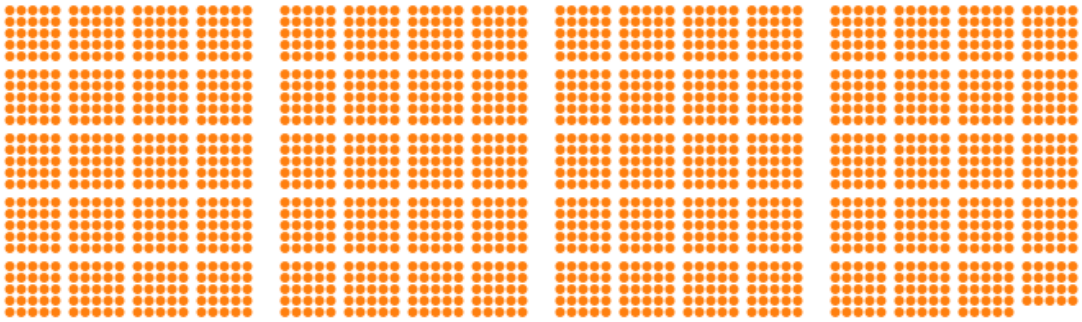
Hierarchy

http://flowingdata.com/2009/10/20/how-much-do-ceos-make-in-the-united-states/

Repetition

Can This Treatment Help Me? There's a Statistic for That

JAN. 26, 2015



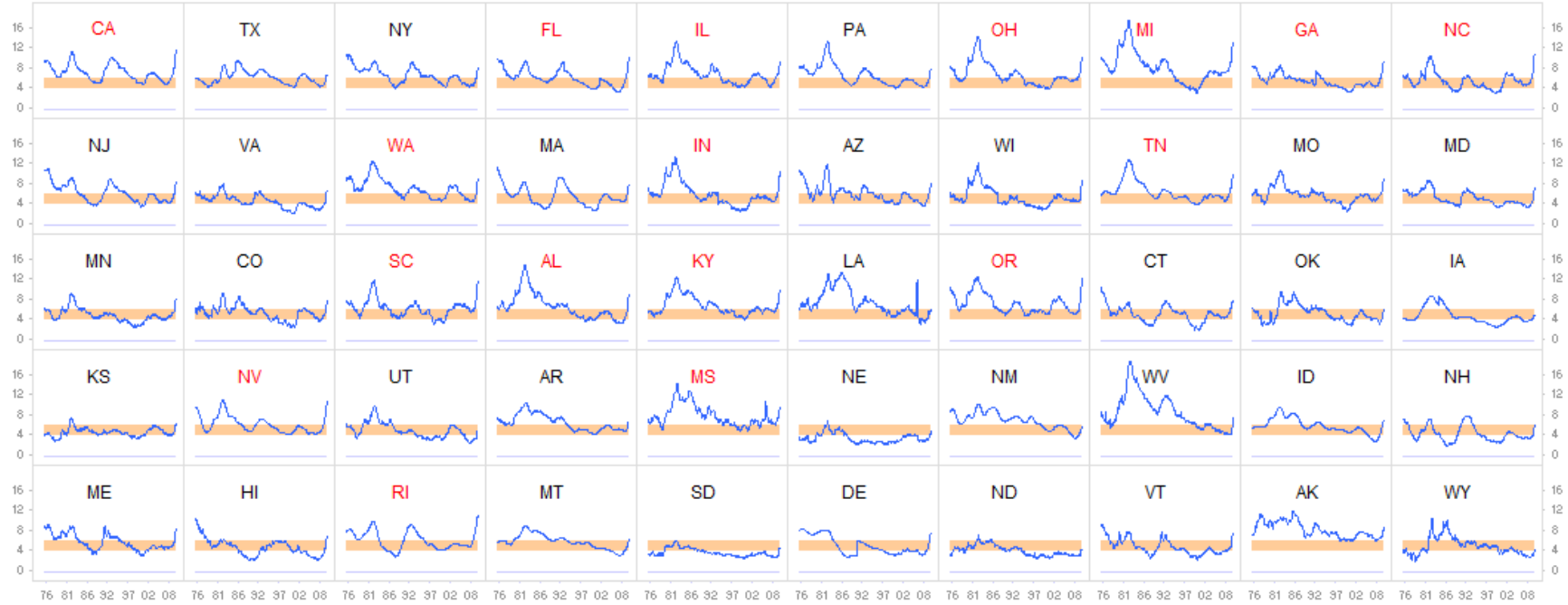
When **2,000** People Take a Daily Aspirin for Two Years: **1** Heart Attack is Prevented

People at risk for a first heart attack are often recommended to take aspirin daily to prevent it. Only a very few will actually see this benefit and there's no way to know in advance who.

http://www.nytimes.com/2015/01/27/upshot/can-this-treatment-help-me-theres-a-statistic-for-that.html

Repetition: small multiples

Monthly Unemployment Rates by State, Jan 1976 - Apr 2009



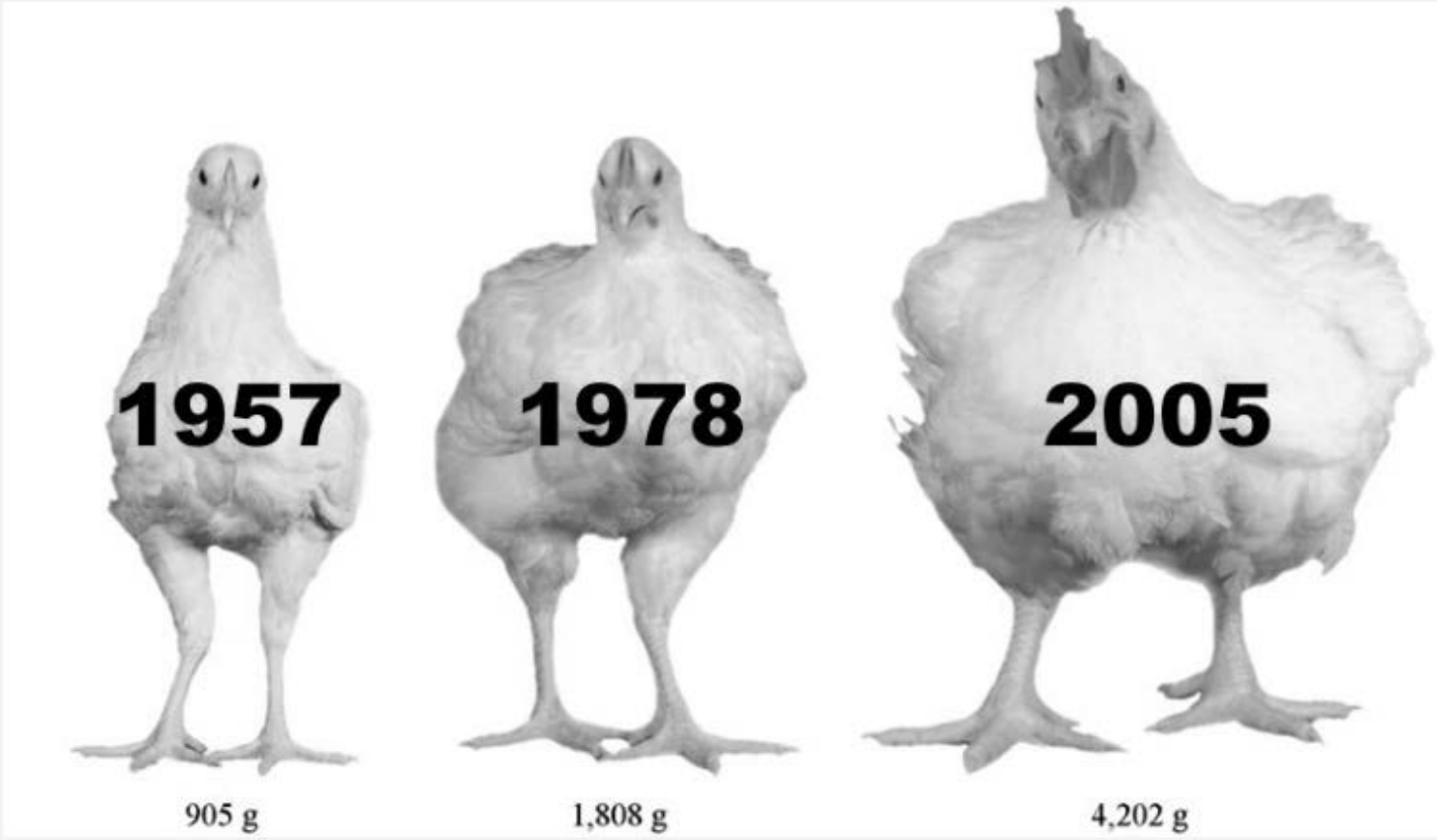
Source: Bureau of Labor Statistics

Notes: The orange band denotes a "normal" unemployment rate (4%-6%);
State code in red: unemployment rate in April 2009 is higher than the US average

http://www.juiceanalytics.com/writing/better-know-visualization-small-multiples

Contrast

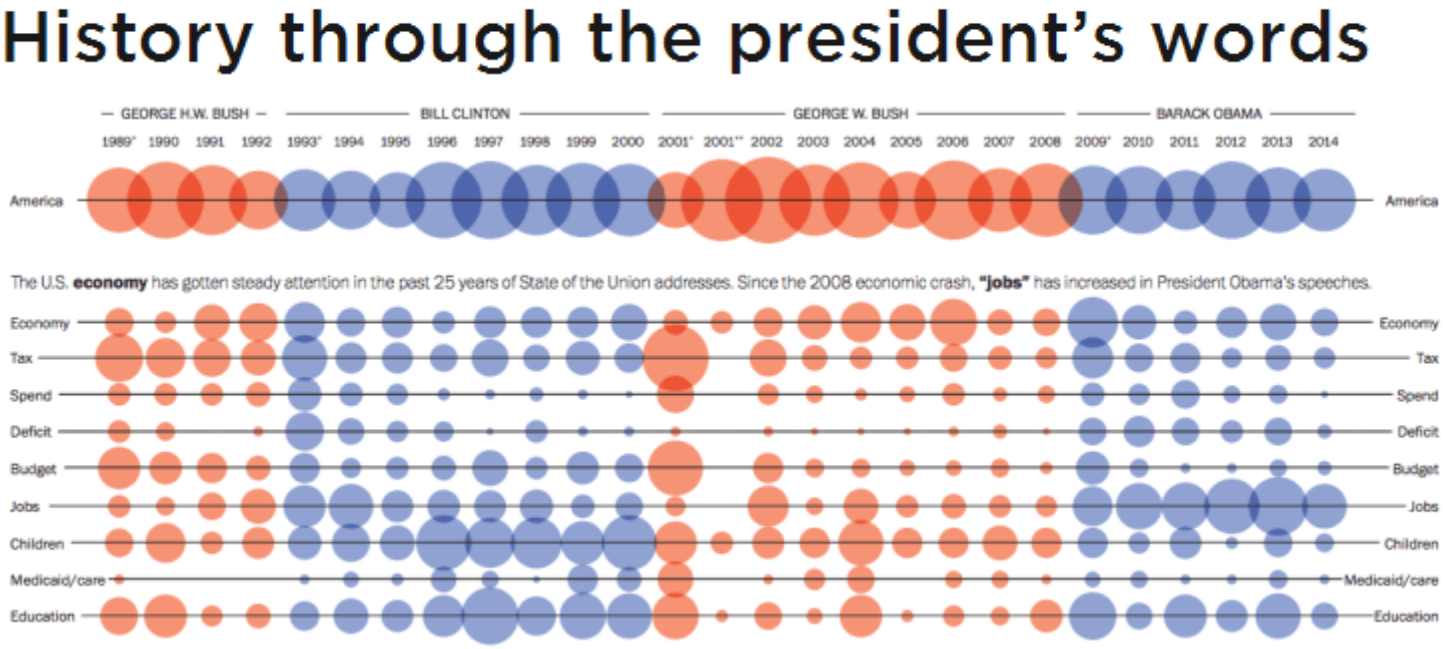
Here are three different breeds of chicken, raised on the exact same diet:



Zuidhof, MJ, et al. 2014 Poultry Science 93 :1–13/Numbers added by Vox

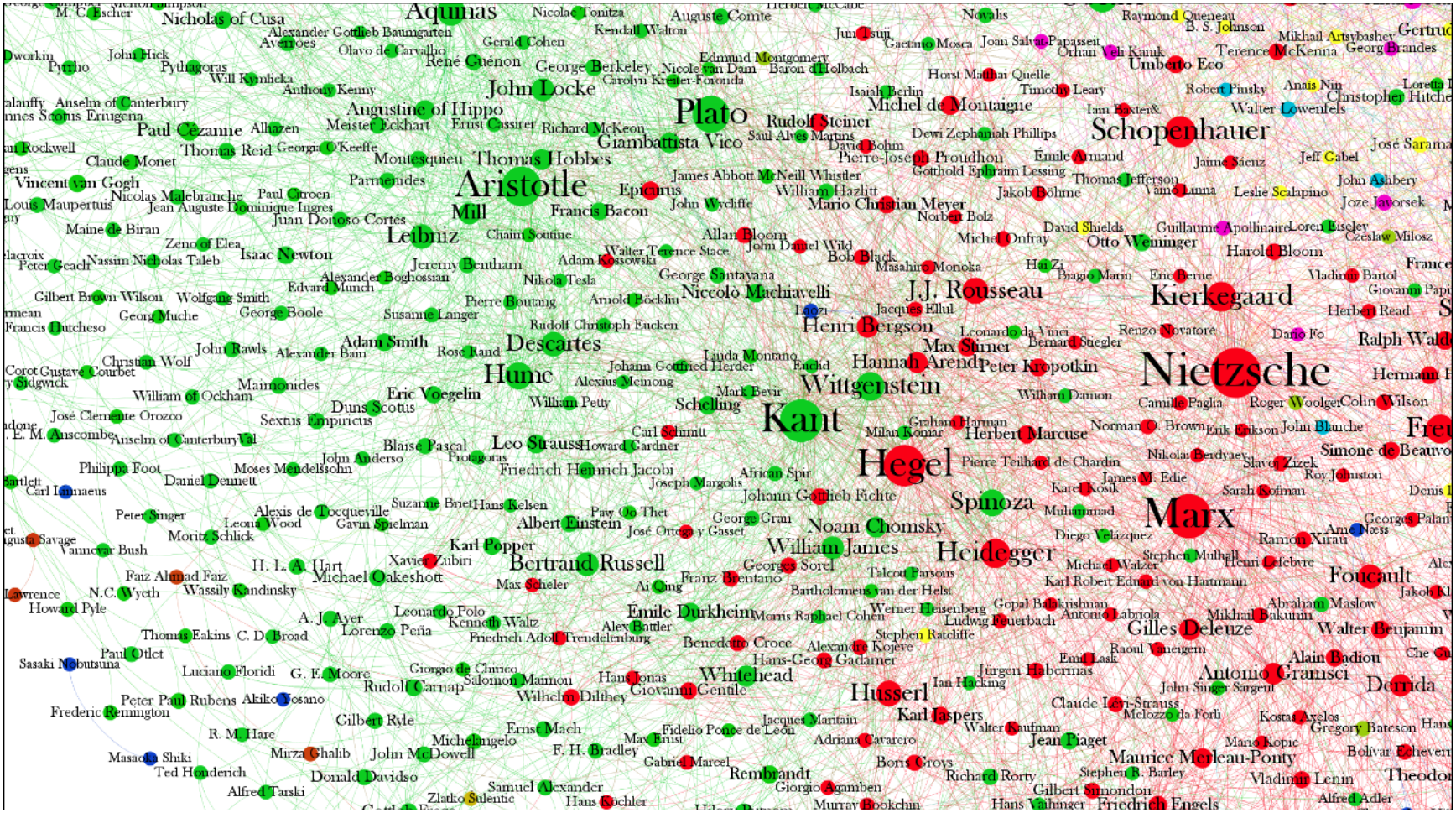
http://www.vox.com/xpress/2014/10/2/6875031/chickens-breeding-farming-boilers-giant

Contrast and color



http://www.washingtonpost.com/wp-srv/special/politics/2014-state-of-the-union/language-of-sotu/

Proximity



http://zoom.it/l3dq

Recommended resources

- Cairo, Alberto (2013). *The Functional Art: An Introduction to Information Graphics and Visualization.*
- Wong, Dona (2014). *The Wall Street Journal Guide to Information Graphics: The Dos and Don'ts of Presenting Data, Facts, and Figures*.

Websites to follow

- Flowing Data, http://flowingdata.com/
- Junk Charts, http://junkcharts.typepad.com/junk_charts/
- 13 pt, http://13pt.com/