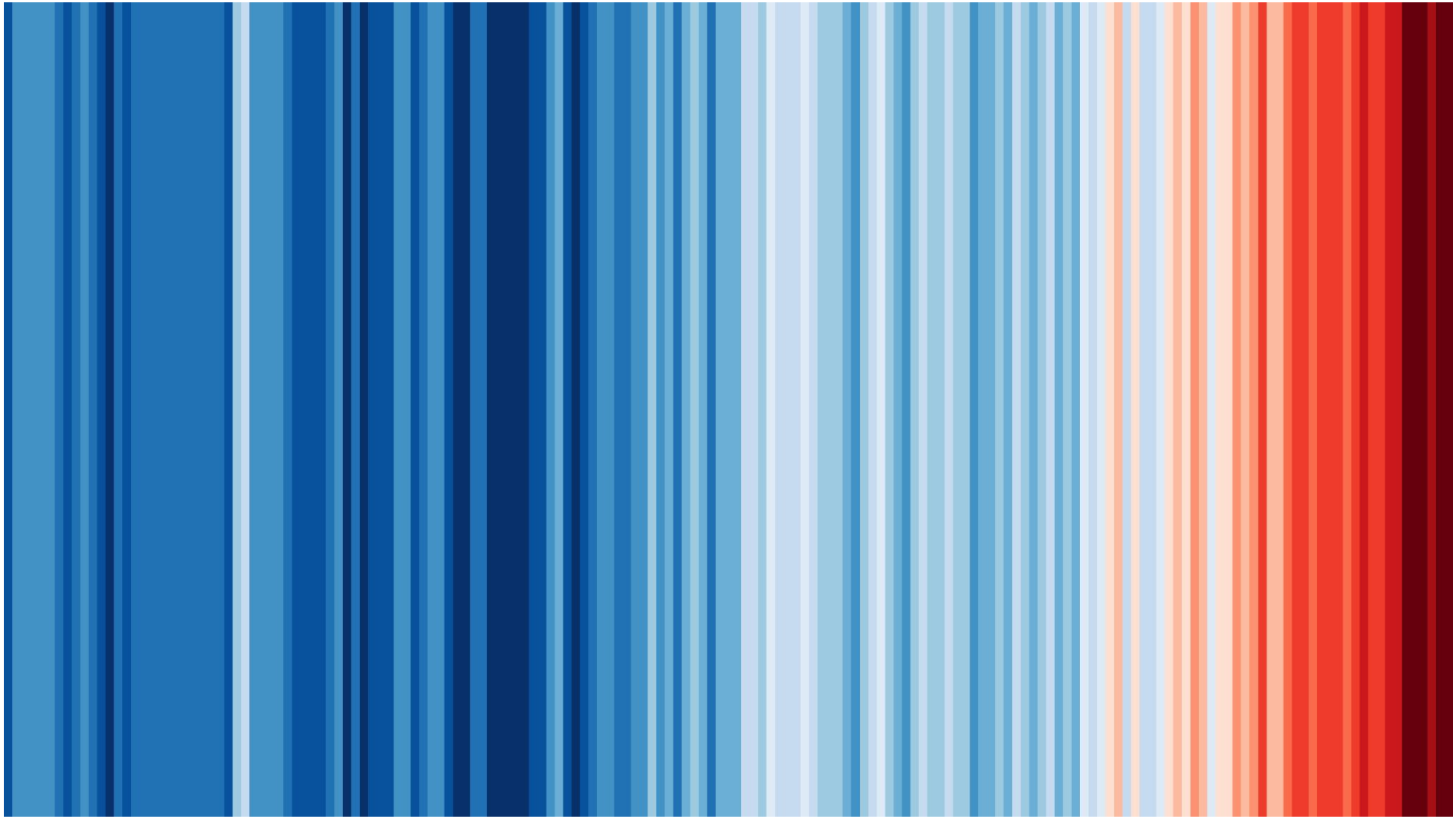
Data storytelling for charities

Alan Rutter
Fire Plus Algebra



“By visualizing information, we turn it into a landscape that you can explore with your eyes. A sort of information map. And when you’re lost in information, an information map is kind of useful.”

David McCandless
Information is Beautiful

Me

@alanrutter
@FireAlgebra
alan@fireplusalgebra.com
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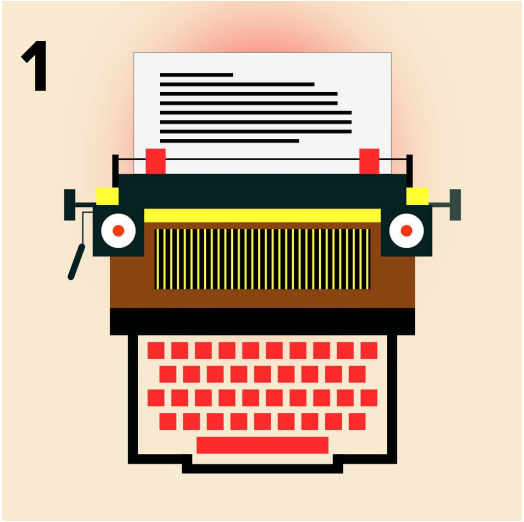
What's the biggest challenge?

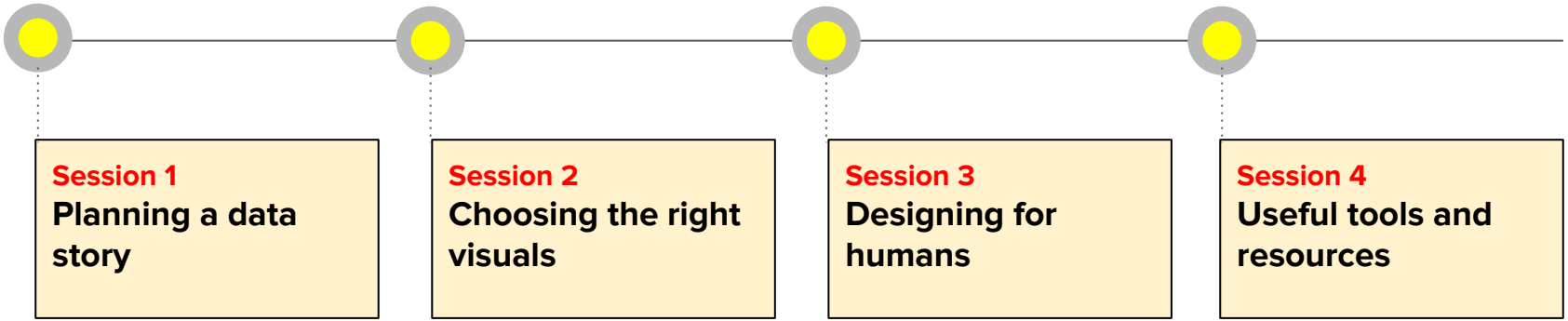


IDENTIFYING THE KEY MESSAGE

CHOOSING THE RIGHT VISUAL

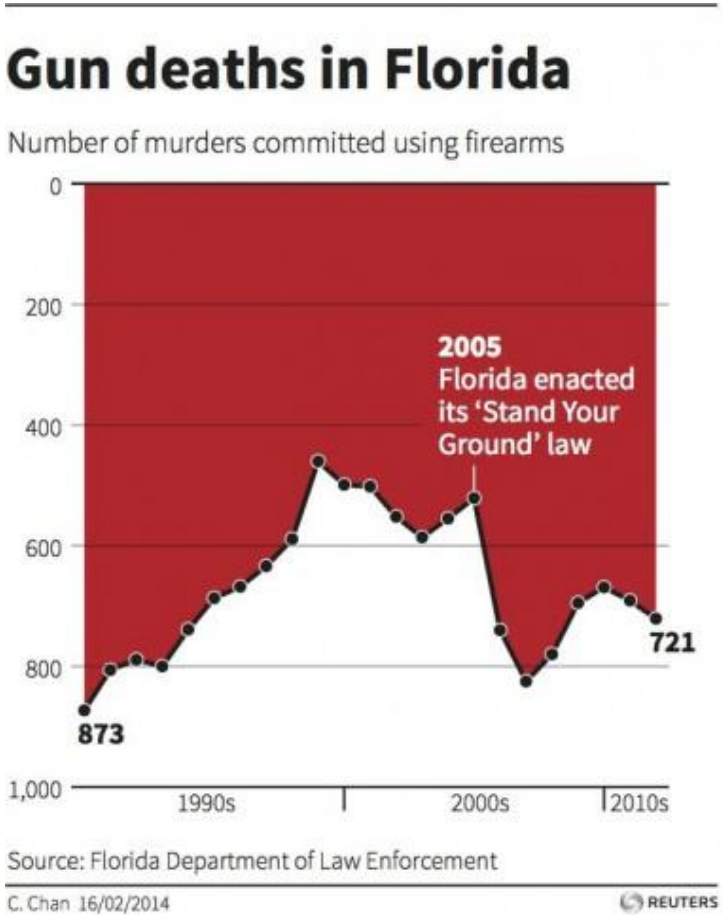
MAKING GREAT DESIGN CHOICES

Agenda

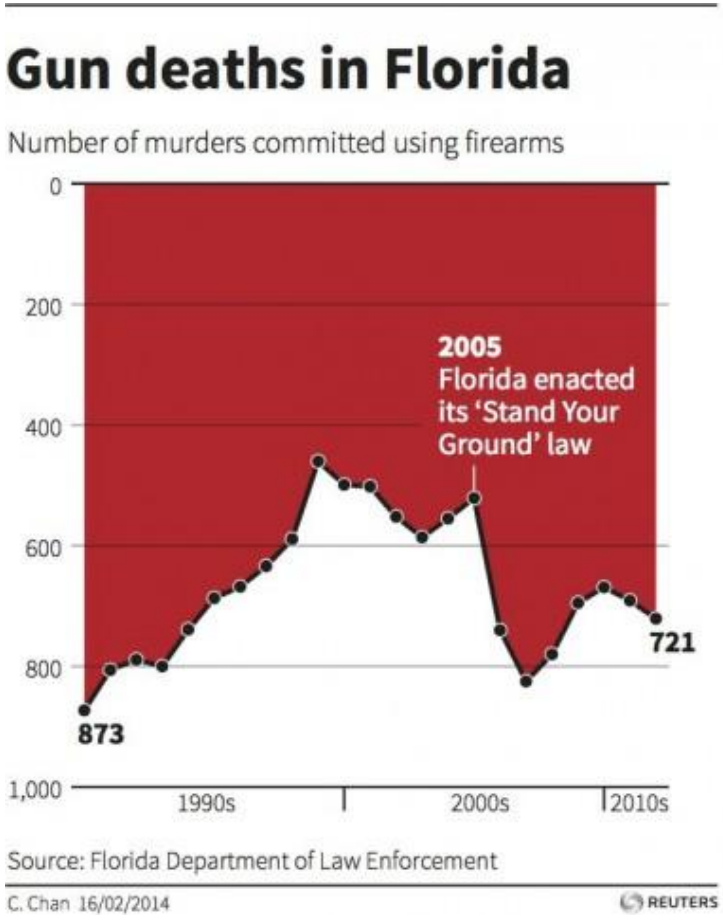

Session 1
Planning a data story
Session 2
Choosing the right visuals
Session 3
Designing for humans
Session 4
Useful tools and resources

1

Planning a data story



Published by Reuters



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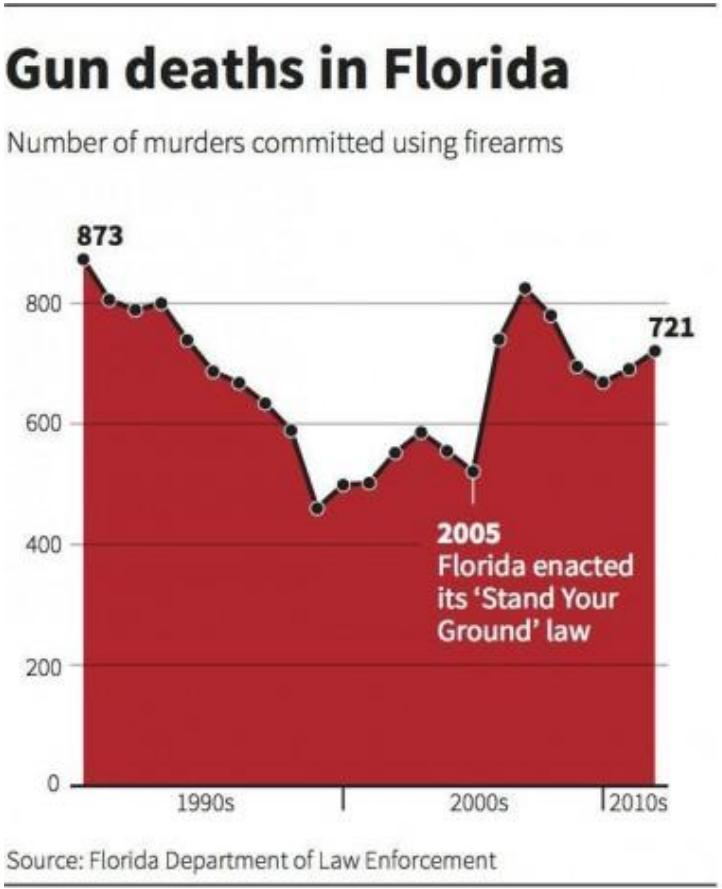
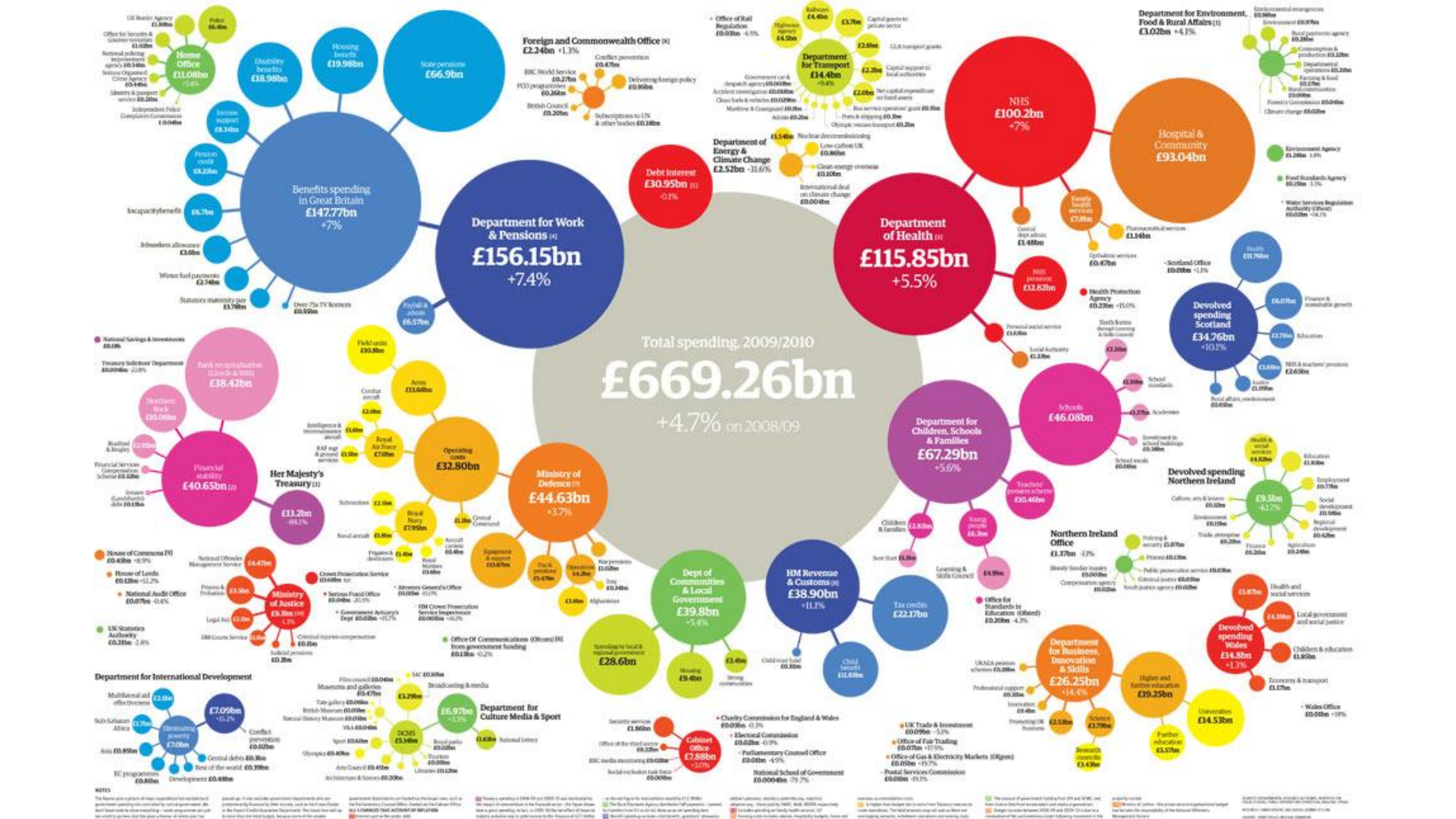
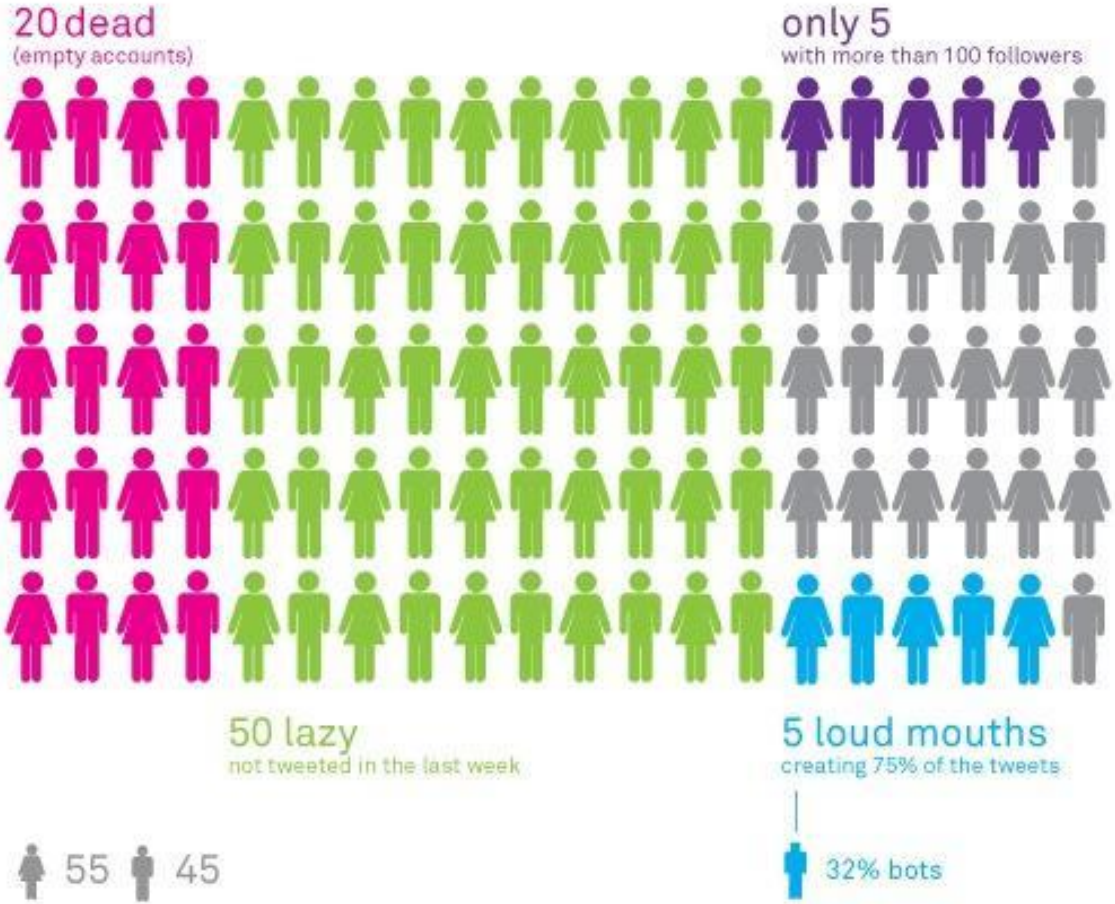


Fixed by Business Insider

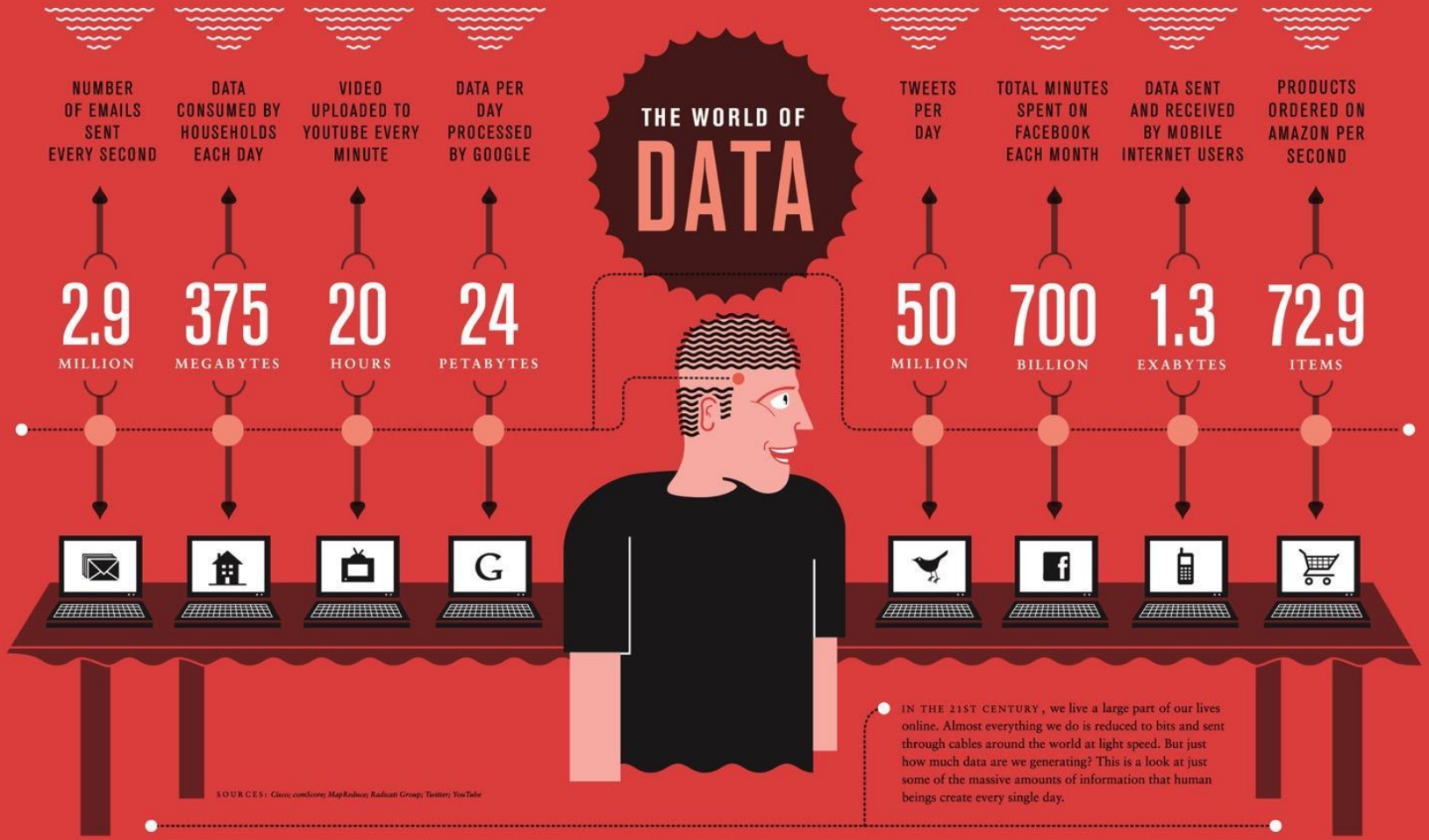

Total spending, 2009/2010
£669.26bn
+4.7% on 2008/09
Department for Work & Pensions [4]
£156.15bn
+7.4%
Benefits spending in Great Britain
£147.77bn
+7%
State pensions £66.9bn
Housing benefit £19.98bn
Disability benefits £18.98bn
Income support £8.34bn
Pension credit £8.2bn
Incapacity benefit £6.7bn
Jobseekers allowance £3.6bn
Winter fuel payments £2.74bn
Statutory maternity pay £1.79bn
Over-75s TV licences £0.55bn
Home Office £11.08bn +3.4%
UK Border Agency £1.89bn
Police £6.4bn
Office for Security & Counter-terrorism £1.02bn
National policing improvements agency £0.54bn
Serious Organised Crime Agency £0.44bn
Identity & passport service £0.26bn
Independent Police Complaints Commission £0.04bn
Debt interest £30.95bn [1] -0.1%
Department of Health [3]
£115.85bn
+5.5%
NHS £100.2bn +7%
Hospital & Community £93.04bn
NHS pensions £12.82bn
Central dept admin £1.48bn
Family health services £7.98bn
Pharmaceutical services £1.14bn
Ophthalmic services £0.47bn
Health Protection Agency £0.23bn +15.0%
Personal social services £1.63bn
Local Authority £1.23bn
Department for Transport £14.4bn +9.4%
Office of Rail Regulation £0.03bn -4.5%
Highways Agency £4.5bn
Railways £4.4bn
£3.7bn Capital grants to private sector
£2.6bn LEA transport grants
£2.2bn Capital support to local authorities
£2.0bn Net capital expenditure on fixed assets
Bus service operators' grant £0.5bn
Ports & shipping £0.3bn
Olympic venues transport £0.2bn
Government car & despatch agency £0.03bn
Accident investigation £0.04bn
Class bars & vehicles £0.029bn
Maritime & Coastguard £0.8bn
Admin £0.2bn
Department of Energy & Climate Change £2.52bn -33.6%
£1.54bn Nuclear decommissioning
Low-carbon UK £0.86bn
Clean-energy overseas £0.10bn
International deal on climate change £0.004bn
Foreign and Commonwealth Office [6] £2.24bn +1.3%
Conflict prevention £0.47bn
Delivering foreign policy £0.95bn
Subscriptions to UN & other bodies £0.18bn
BBC World Service £0.27bn
FCO programmes £0.26bn
British Council £0.20bn
Department for Environment, Food & Rural Affairs [11] £3.02bn +4.1%
Environmental emergencies £0.98bn
Environment £0.97bn
Rural payments agency £0.38bn
Consumption & production £0.12bn
Departmental operations £0.23bn
Farming & food £0.17bn
Rural communities £0.09bn
Forestry Commission £0.04bn
Climate change £0.02bn
Environment Agency £1.28bn -1.8%
Food Standards Agency £0.15bn -1.3%
Water Services Regulation Authority (Ofwat) £0.02bn +14.1%
Devolved spending Scotland £34.76bn +10.1%
Health £11.76bn
Finance & sustainable growth £6.07bn
Education £2.78bn
NHS & teachers' pensions £2.65bn
Justice £1.09bn
Rural affairs, environment £0.65bn
Scotland Office £0.08bn +1.1%
Devolved spending Northern Ireland £9.5bn -12.7%
Health & social services £4.62bn
Education £1.83bn
Employment £0.77bn
Social development £0.98bn
Regional development £0.42bn
Agriculture £0.24bn
Finance £0.26bn
Culture, arts & leisure £0.11bn
Environment £0.15bn
Trade, enterprise £0.28bn
Devolved spending Wales £14.8bn +1.7%
Health and social services £5.87bn
Local government and social justice £4.39bn
Children & education £1.85bn
Economy & transport £1.17bn
Wales Office £0.08bn +18%
Northern Ireland Office £1.37bn -13%
Policing & security £1.07bn
Prisons £0.13bn
Public prosecution service £0.03bn
Criminal justice £0.03bn
Youth justice agency £0.02bn
Bloody Sunday inquiry £0.08bn
Compensation agency £0.03bn
Department for Children, Schools & Families £67.29bn +5.6%
Schools £46.08bn
£3.28bn
£3.95bn School standards
£1.27bn Academies
Investment in school buildings £0.38bn
School meals £0.05bn
Teachers' pension scheme £10.46bn
Children & families £3.83bn
Sure Start £1.9bn
Young people £6.3bn
Learning & Skills Council £4.9bn
Office for Standards in Education (Ofsted) £0.20bn -4.3%
Department for Communities & Local Government £39.8bn +5.4%
Spending by local & regional government £28.6bn
Housing £9.4bn
£2.4bn Strong communities
HM Revenue & Customs [9] £38.90bn +11.1%
Tax credits £22.17bn
Child benefit £11.93bn
Child trust fund £0.31bn
Ministry of Defence [7] £44.63bn +3.7%
Operating costs £32.80bn
Army £13.68bn
Field units £10.8bn
Combat aircraft £2.8bn
Royal Air Force £7.09bn
Intelligence & reconnaissance aircraft £1.6bn
RAF regt & ground services £1.3bn
Royal Navy £7.95bn
Submarines £2.5bn
Naval aircraft £1.8bn
Frigates & destroyers £1.4bn
Aircraft carriers £0.4bn
Naval Munitions £0.6bn
Central Command £1.3bn
Equipment & support £13.87bn
Pay & pensions £5.47bn
Operations £4.2bn
War pensions £1.02bn
Iraq £0.34bn
Afghanistan £3.8bn
Her Majesty's Treasury [2] £13.2bn -68.1%
Financial stability £40.65bn [12]
Bank recapitalisation (Lloyds & RBS) £38.42bn
Northern Rock £10.06bn
Bradford & Bingley £2.95bn
Financial Services Compensation Scheme £0.52bn
Insolvency (Landsbanki) £0.15bn
National Savings & Investments £0.1bn
Treasury Solicitors' Department £0.009bn -13.8%
House of Commons [5] £0.43bn -8.9%
House of Lords £0.12bn +12.2%
National Audit Office £0.07bn -0.4%
UK Statistics Authority £0.21bn -2.8%
Ministry of Justice £9.3bn [10] -1.3%
National Offender Management Service £4.47bn
Finance & Probation £1.9bn
Legal Aid £2.1bn
HM Courts Service £1.2bn
Crown Prosecution Service £0.69bn -10.5%
Serious Fraud Office £0.04bn -30.5%
Government Actuary's Dept £0.02bn +13.7%
Attorney General's Office £0.01bn -15.0%
HM Crown Prosecution Service Inspectorate £0.00bn +6.3%
Criminal injuries compensation £0.1bn
Judicial pensions £0.3bn
Office Of Communications (Ofcom) [13] £0.13bn +2.2%
Department for International Development £7.09bn +15.2%
Multilateral aid effectiveness £2.1bn
Sub-Saharan Africa £1.7bn
Asia £1.85bn
Eliminating poverty £2.0bn
Conflict prevention £0.02bn
Central debts £0.1bn
Rest of the world £0.39bn
EC programmes £0.88bn
Development £0.48bn
Department for Culture Media & Sport £6.97bn +1.9%
Broadcasting & media £3.29bn
BBC £3.03bn
Film council £0.04bn
Museums and galleries £0.47bn
Tate gallery £0.09bn
British Museum £0.09bn
Natural History Museum £0.09bn
V&A £0.04bn
DCMS £5.34bn
Sport £0.61bn
Olympics £0.40bn
Arts Council £0.45bn
Architecture & history £0.20bn
Royal parks £0.02bn
Tourism £0.09bn
Libraries £0.12bn
National lottery £1.81bn
Cabinet Office £7.88bn +10%
Security services £1.86bn
Office of the third sector £0.22bn
BBC media monitoring £0.02bn
Social exclusion task force £0.00bn
Charity Commission for England & Wales £0.03bn -0.3%
Electoral Commission £0.02bn -0.9%
Parliamentary Counsel Office £0.01bn -4.9%
National School of Government £0.000498bn -29.2%
UK Trade & Investment £0.09bn +5.8%
Office of Fair Trading £0.07bn +17.9%
Office of Gas & Electricity Markets (Ofgem) £0.01bn +19.7%
Postal Services Commission £0.01bn -9.3%
Department for Business, Innovation & Skills £26.25bn +14.4%
UKAEA pension schemes £0.28bn
Professional support £0.3bn
Innovation £0.4bn
Promoting UK business £2.53bn
Science £1.79bn
Research councils £3.47bn
Higher and further education £9.25bn
Further education £5.57bn
Universities £14.53bn

If the Twitter community were 100 people



Information is Beautiful

THE WORLD OF DATA



IN THE 21ST CENTURY, we live a large part of our lives online. Almost everything we do is reduced to bits and sent through cables around the world at light speed. But just how much data are we generating? This is a look at just some of the massive amounts of information that human beings create every single day.

SOURCES: *Cisco; comScore; MapReduce; Radicati Group; Twitter; YouTube*

A COLLABORATION BETWEEN GOOD AND OLIVER MUNDAY

IN PARTNERSHIP WITH IBM

SIMPLE INNOVATIONS HELP AFRICAN FARMERS THRIVE

Approximately one billion people live in chronic hunger and more than one billion live in extreme poverty. Most are small farmers in the developing world. Helping these farming families to be more productive is one proven solution to reducing poverty and hunger. Simple solutions like the ones shown here are helping make a difference in the lives of smallholder farmers and their families.

Better Information

TEACHES
FARMERS TO INCREASE YIELDS

Working with radio stations in five African countries, a radio project has reached 39 million farmers with valuable information on a range of agricultural techniques to help farmers improve their productivity and access to markets.

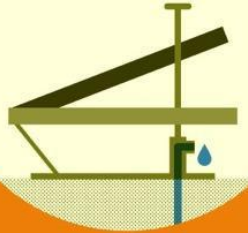
Better Seeds

30%
MORE YIELD IN DROUGHT-PRONE AREAS

New and improved maize (corn) varieties that can survive on less water are already helping more than 2 million smallholder farmers in Africa get higher yields and incomes.

Better Tools

50%
MORE AFFORDABLE THAN MOTORIZED PUMPS



Instead of buying motorized pumps that are costly and difficult to maintain, farmers are using "foot power" to operate treadle pumps that can lift water from 20 feet below the surface.

Better Storage

PROTECTS
CROPS FROM INSECTS

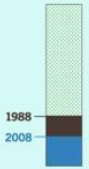
Special storage bags cost only $2 and protect cowpea crops from destructive insects. Since 2007, more than one million bags have been sold, saving harvests for thousands of farmers.

GROWING SUCCESS IN GHANA

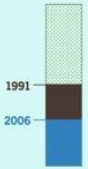
Facing severe food shortages in the mid-1980s, the Ghanaian government increased investments to help rebuild the nation's agricultural system. Through this effort, farmers received technical advice, seeds, fertilizer, ways to manage insects and disease, and gained access to new markets.

HUNGER LEVELS DROPPED by **75 percent** between 1990 and 2004.

CHILD MALNUTRITION has been **REDUCED** by **almost 50 percent** since the end of the 1980s.



The proportion of **UNDER-WEIGHT INFANTS DECREASED** from 30 percent in 1988 to **17 percent** in 2008.

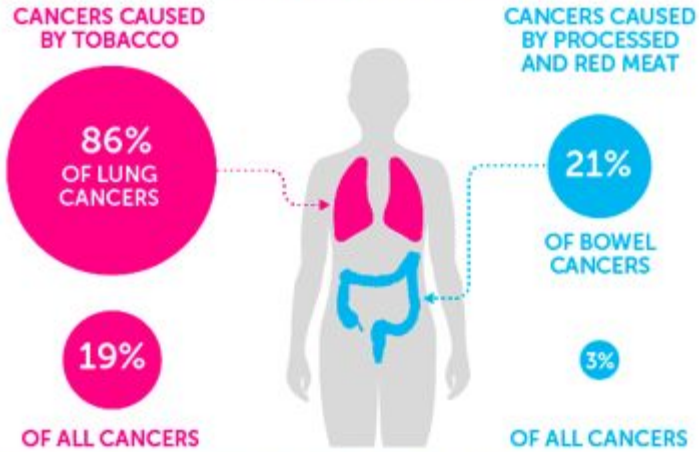


The population living in **POVERTY FELL** from 52 percent in 1991-92 to **28.5 percent** in 2005-2006.

GOOD, IN PARTNERSHIP WITH THE **BILL & MELINDA GATES FOUNDATION**. SOURCE: **BILL & MELINDA GATES FOUNDATION**

TOBACCO vs MEAT WHAT'S THE RISK?

The EVIDENCE that processed meat causes cancer is as strong as the evidence for tobacco, but the RISK from tobacco is much higher...



THE NUMBER OF CANCERS PER YEAR IN THE UK THAT COULD BE PREVENTED IF...

Source: cruk.org/cancerstats

CANCER RESEARCH UK

The essential ingredients

Audience

Story

Action

A data visualisation framework

AUDIENCE

STORY

ACTION

- Who exactly are you presenting the data to?
- How much do they know about the subject?
- How data-literate are they?
- Are they likely to be hostile, or receptive?
- What format are they receiving the information in?
- How long will they spend with it?

A data visualisation framework

AUDIENCE

STORY

ACTION

- What is the key message, or the bottom line?
- Can you sum it up in a single sentence?
- Are there multiple stories to tell?
- What do you need to include to tell the story?
- What can you leave out entirely?
- What is the best visual approach?

A data visualisation framework

AUDIENCE

STORY

ACTION

- What do you want them to do next?
- Take a specific action?
- Carry out a piece of work based on the information?
- Change their behaviour?
- Is the action achievable by them?
- Is the action measurable by you?

Exercise:

Audience, Story, Action

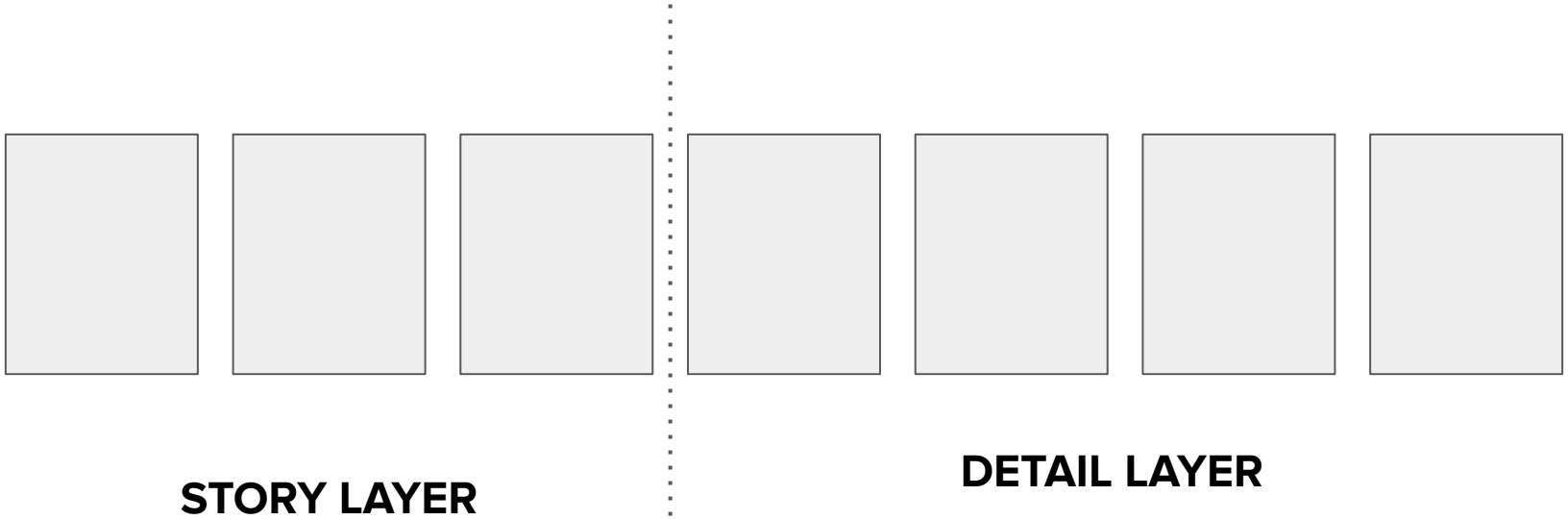
In groups, agree on a real-world example of data that needs to be communicated to somebody.

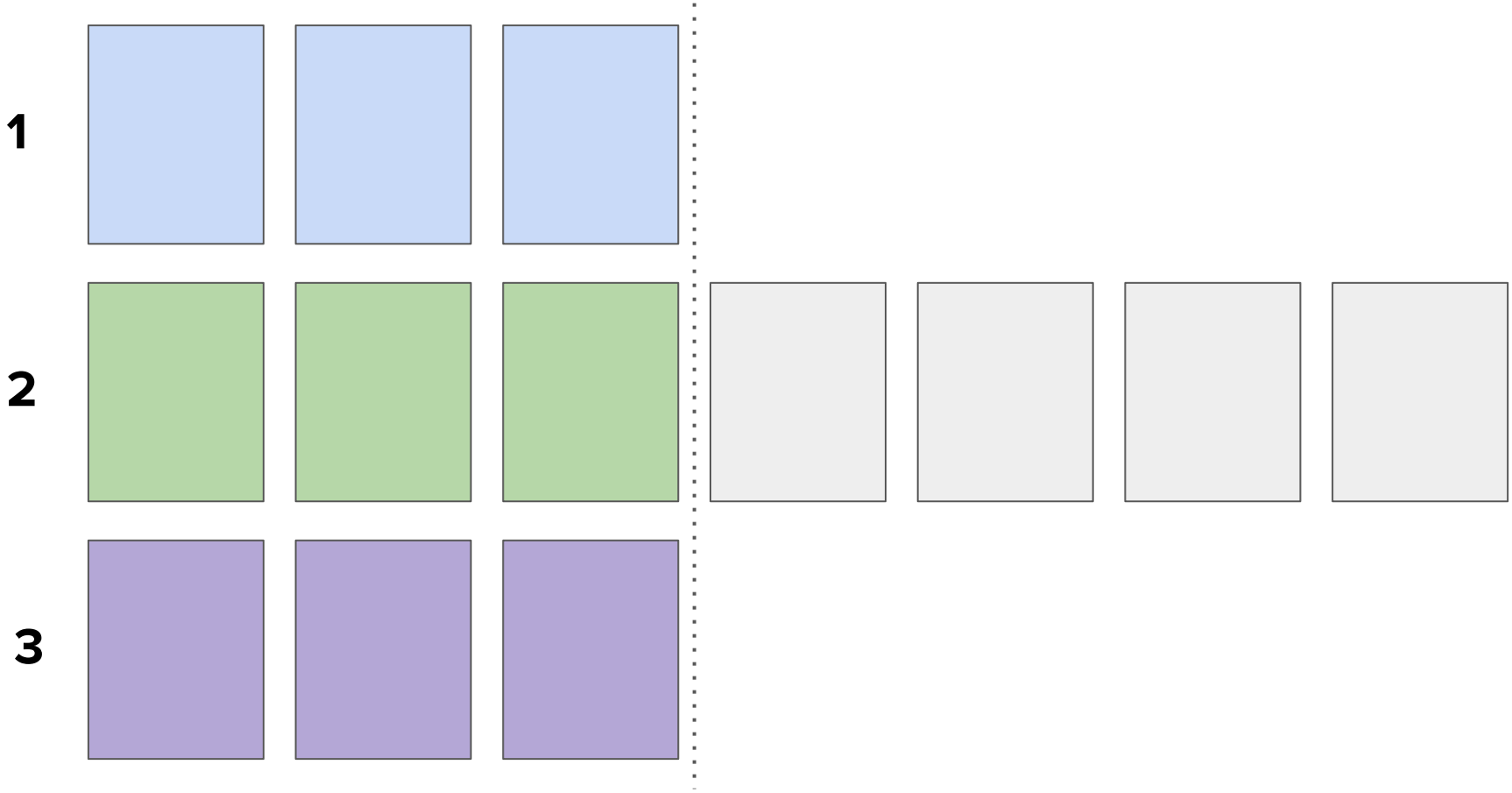
Discuss and agree:

- **Audience** Who are you communicating with?
- **Story** What specific message do you need to communicate?
- **Action** What do they need to do next?

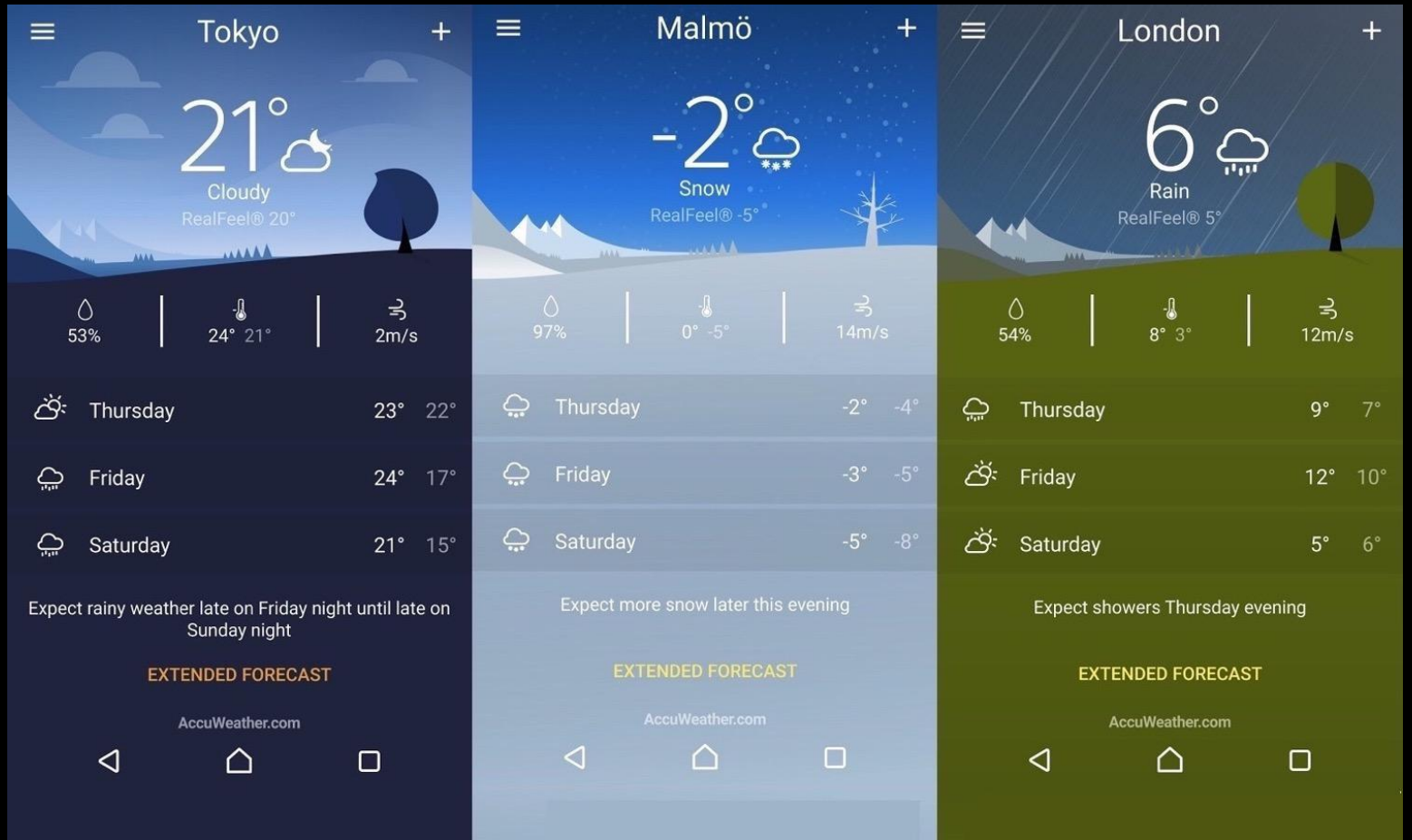
Try to sketch out what the visualisation would look like using **Padlet**.

Structuring longer reports

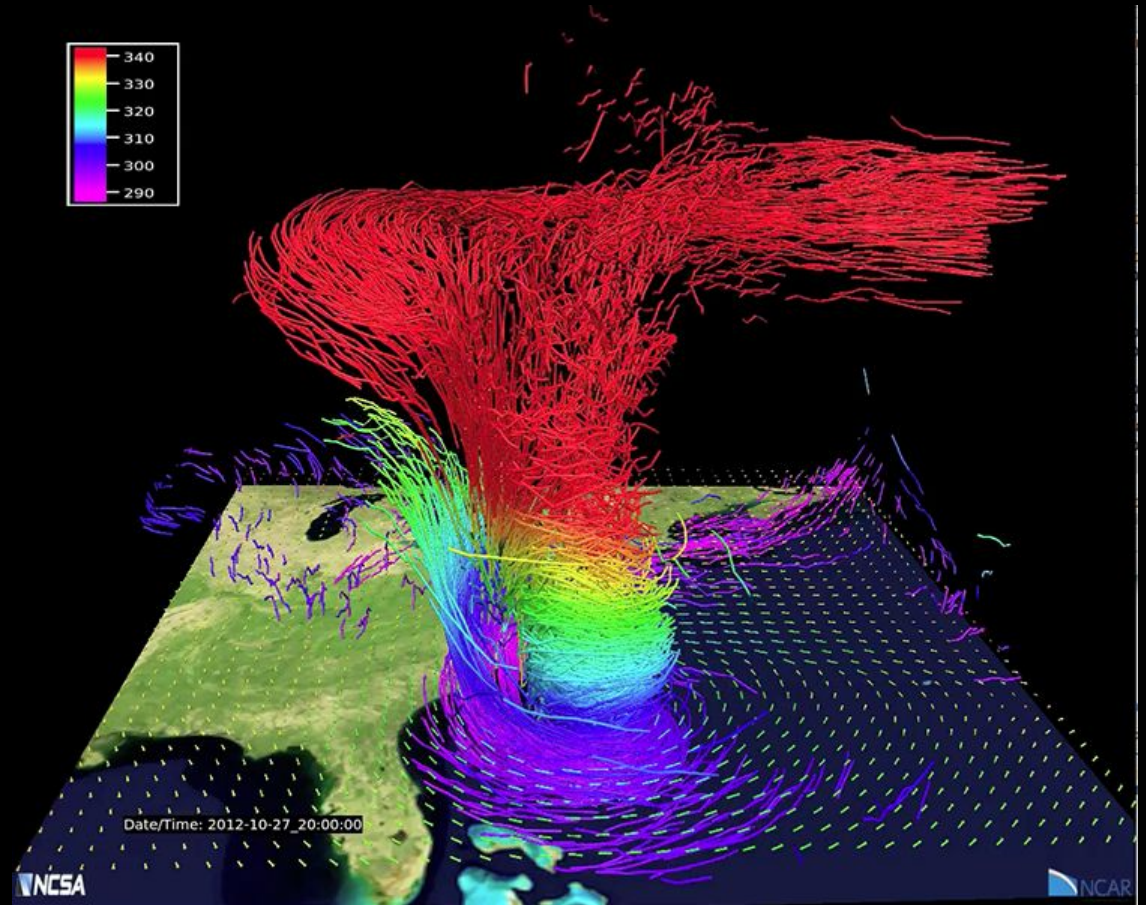



1
2
3

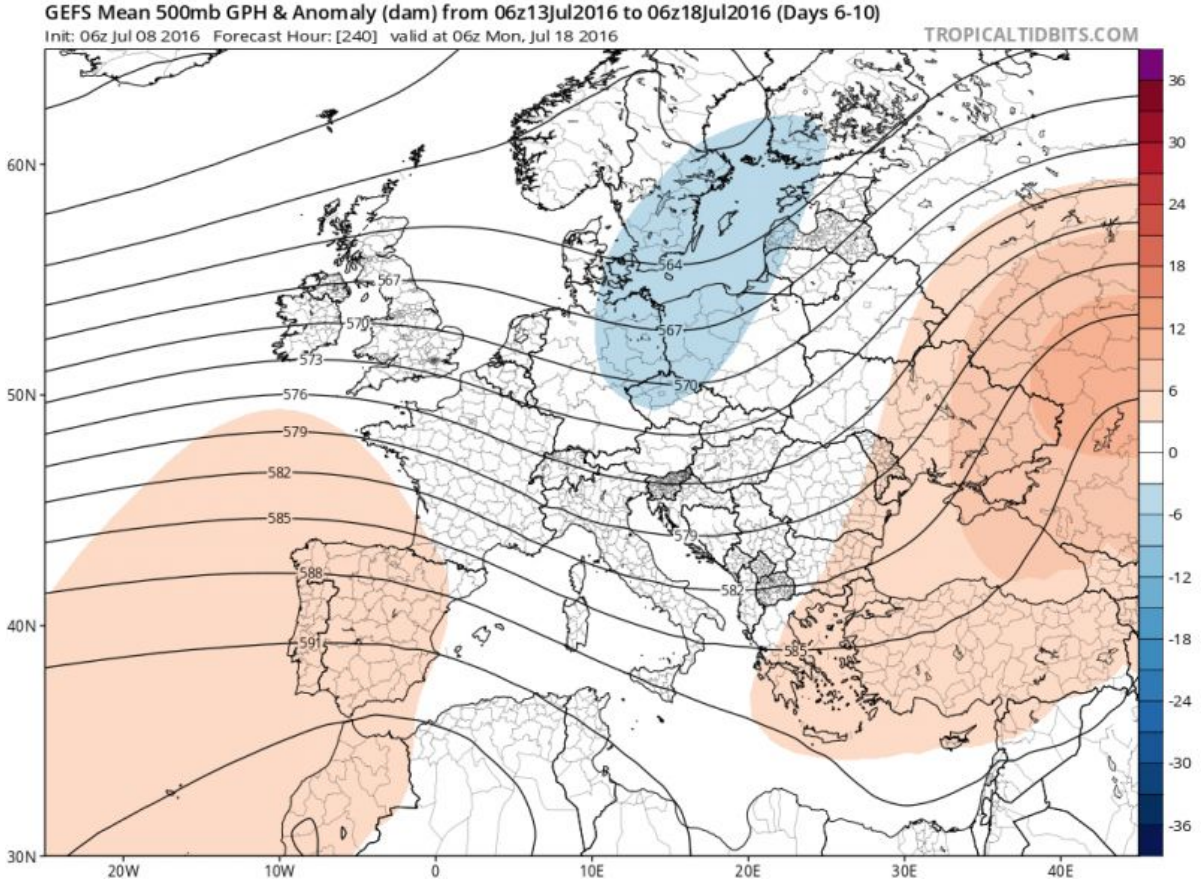
Weather data



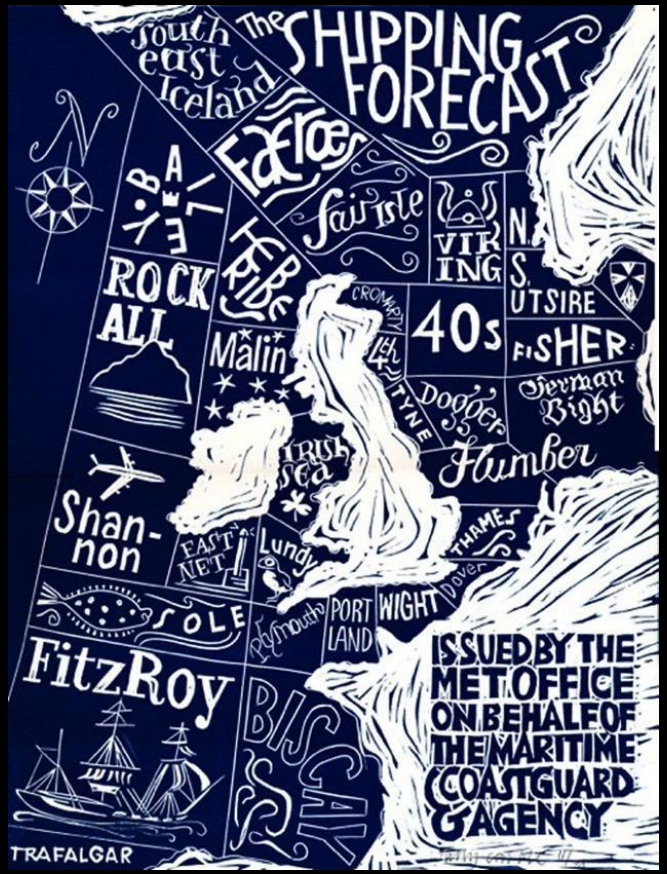
Weather data



Weather data



Weather data



THE SHIPPING FORECAST

The Beaufort Scale

0	Calm
1	Light Air
2	Light Breeze
3	Gentle Breeze
4	Moderate Breeze
5	Fresh Breeze
6	Strong Breeze
7	High Wind
8	Gale
9	Strong/Severe Gale
10	Storm
11	Violent Storm
12	Hurricane Force

Let’s take a short break

(No need to leave the meeting!)

2

Choosing the right visuals

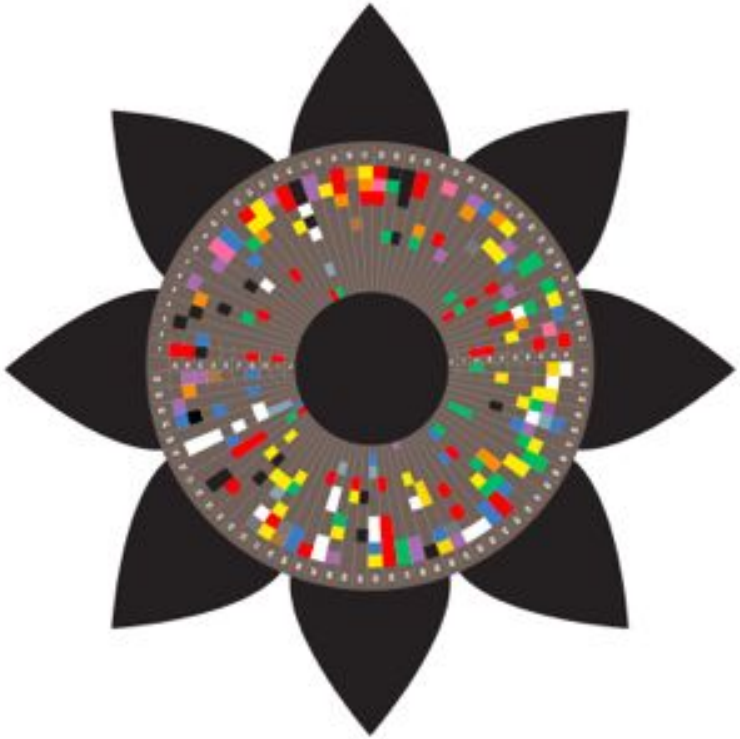
Aesthetics v function

ART **ACADEMIA**

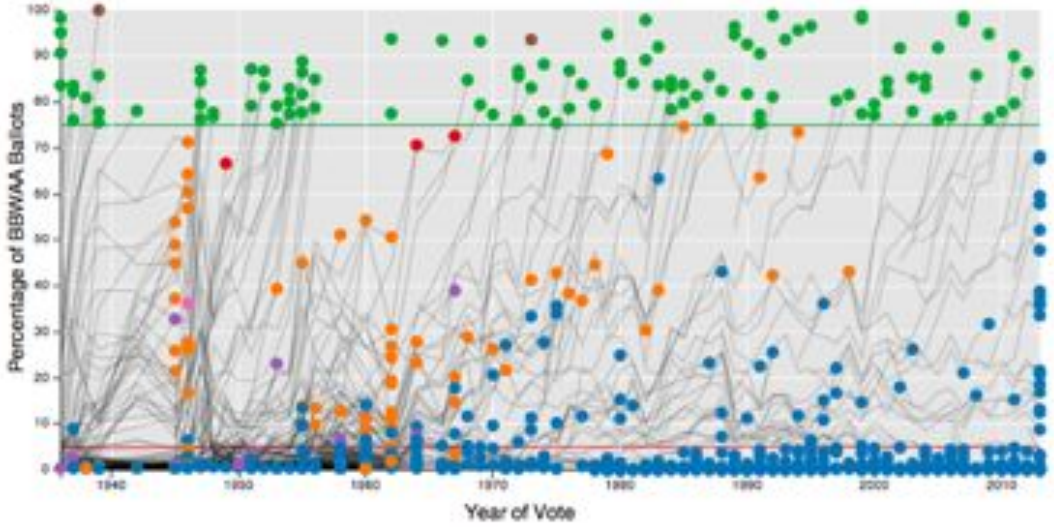
Aesthetics v function

ART

- Beautiful and imaginative.
- Heavy design aesthetic.
- Seen on posters and magazines.
- Demands time to consume.
- Low on actionable insights.



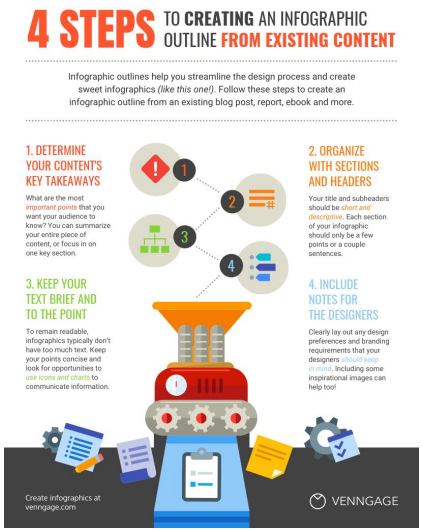
Aesthetics v function



ACADEMIA

- Rigorous and accurate.
- Aimed at expert audiences.
- Confusing to a lay person.
- Seen in academic literature.
- Low on actionable insights.

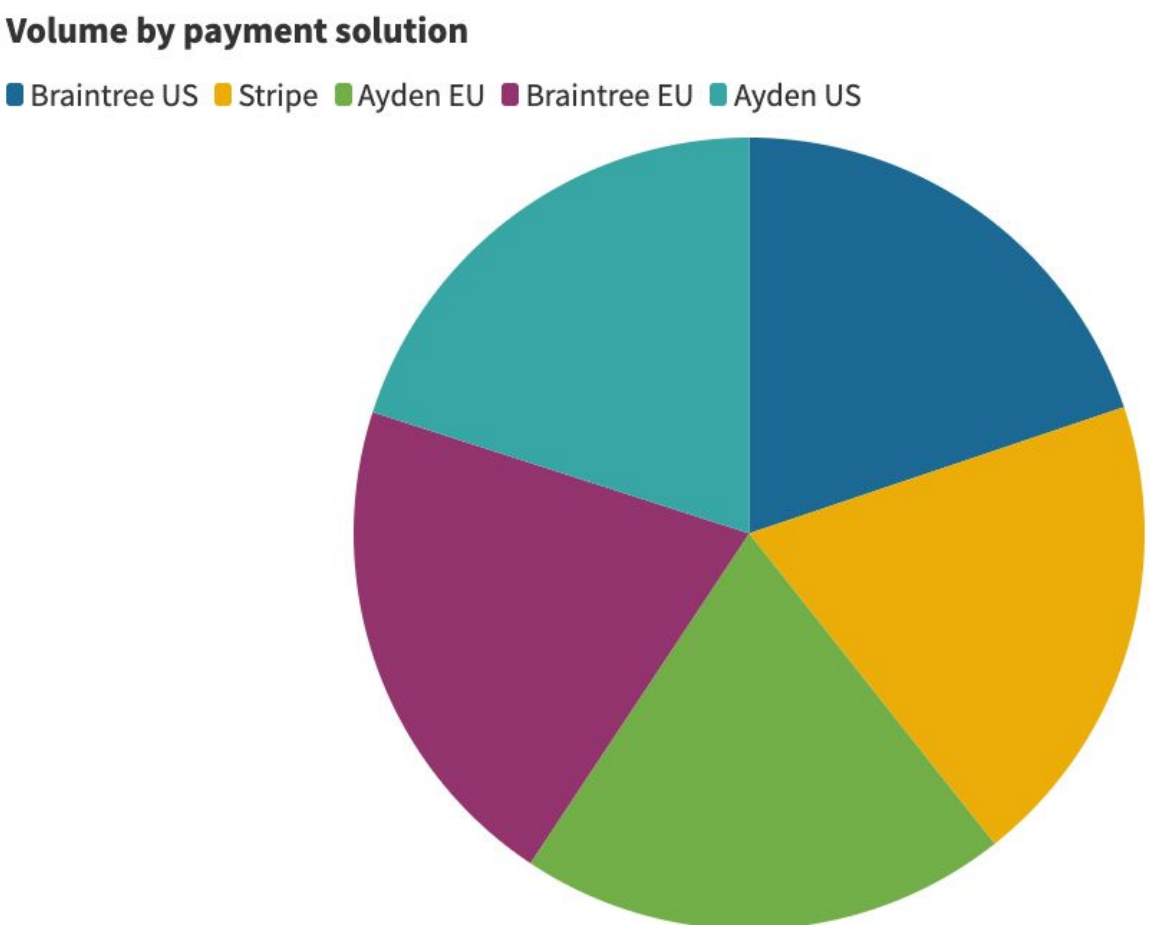
Infographics vs data viz



INFOGRAPHIC

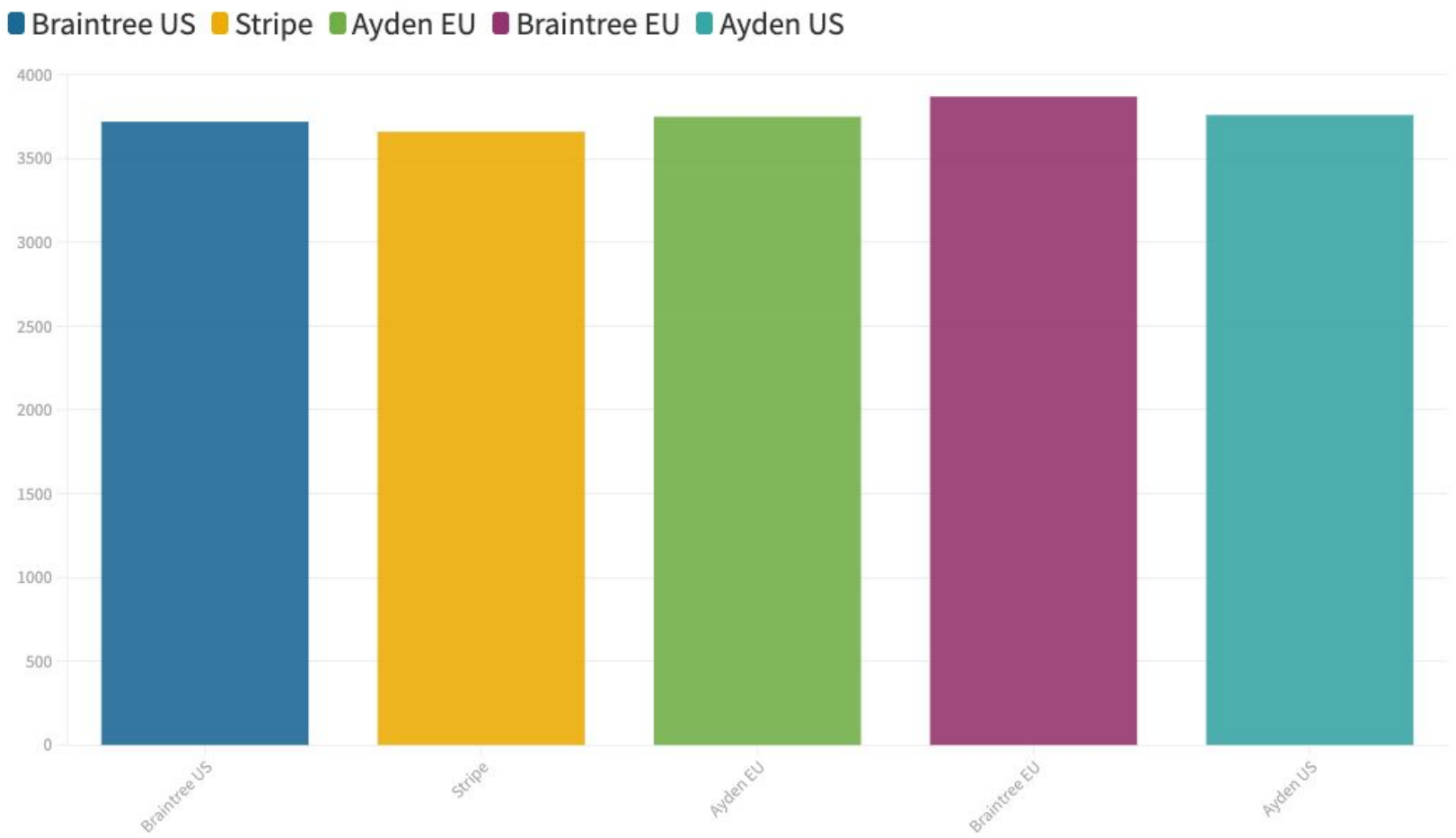
DATA VISUALISATION

INFORMATION DESIGN

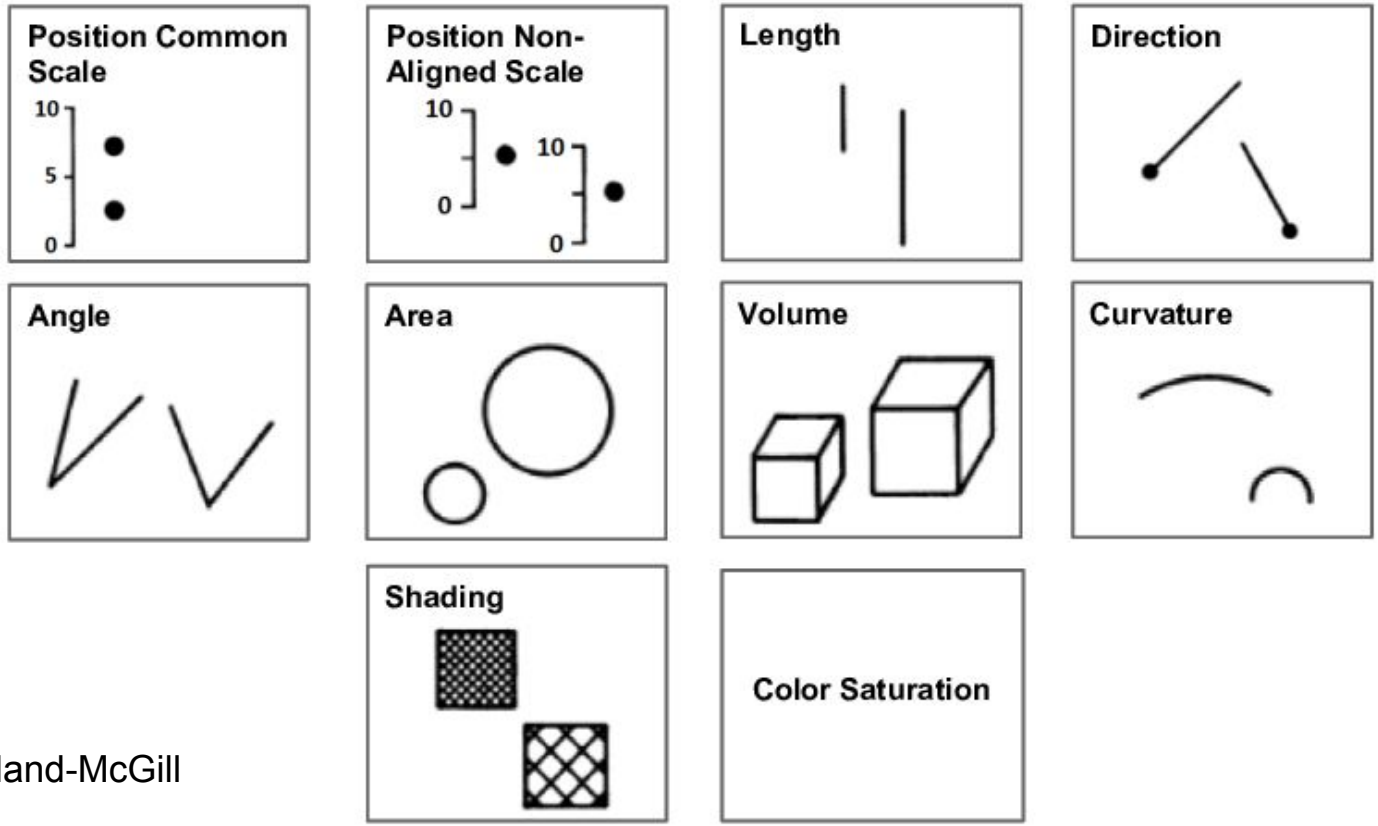


Which is biggest?

Volume by payment solution

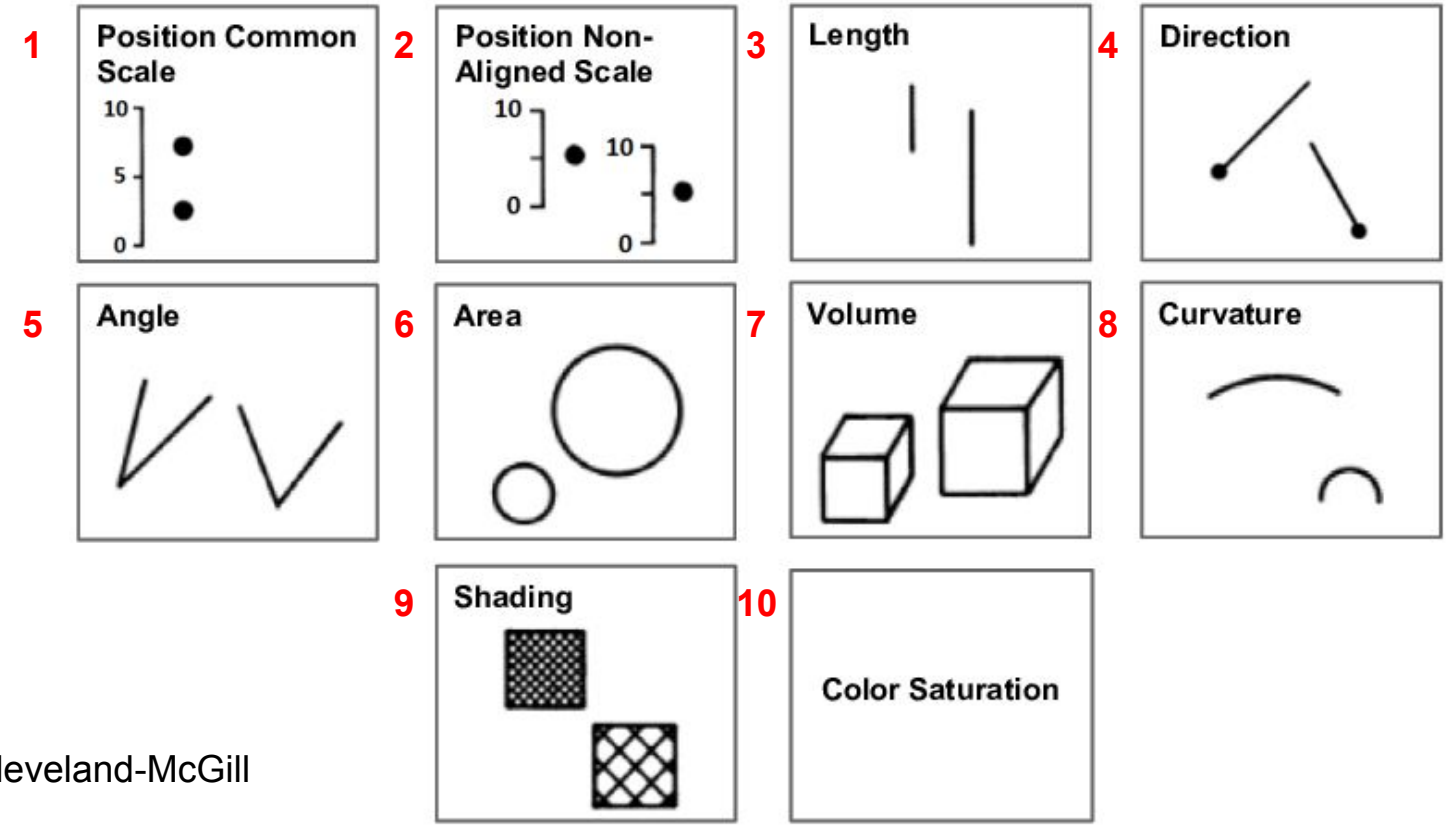


Graphical perception



Source: Cleveland-McGill

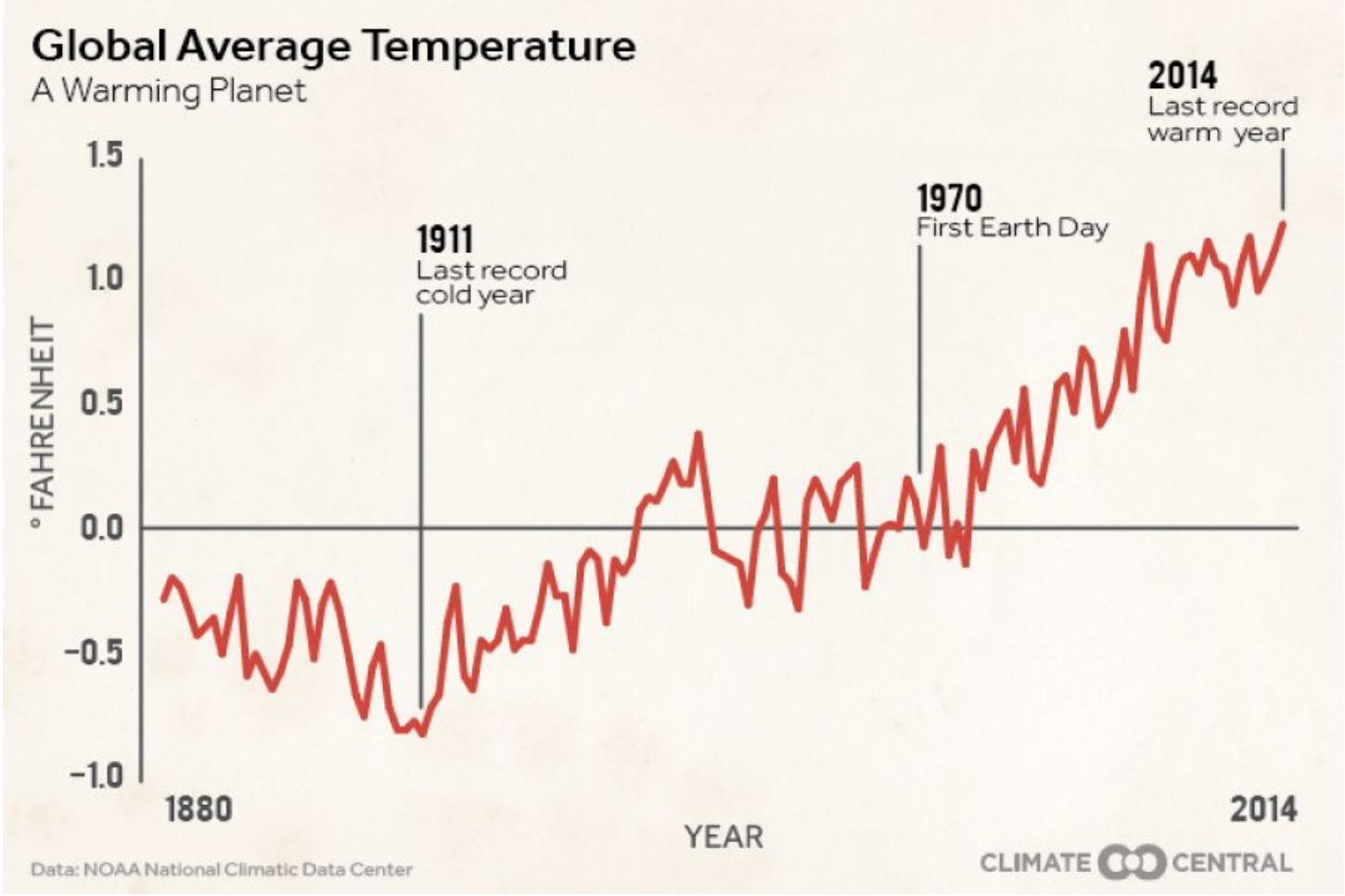
Graphical perception



Source: Cleveland-McGill

Data through time

Which graph or chart type would we use?

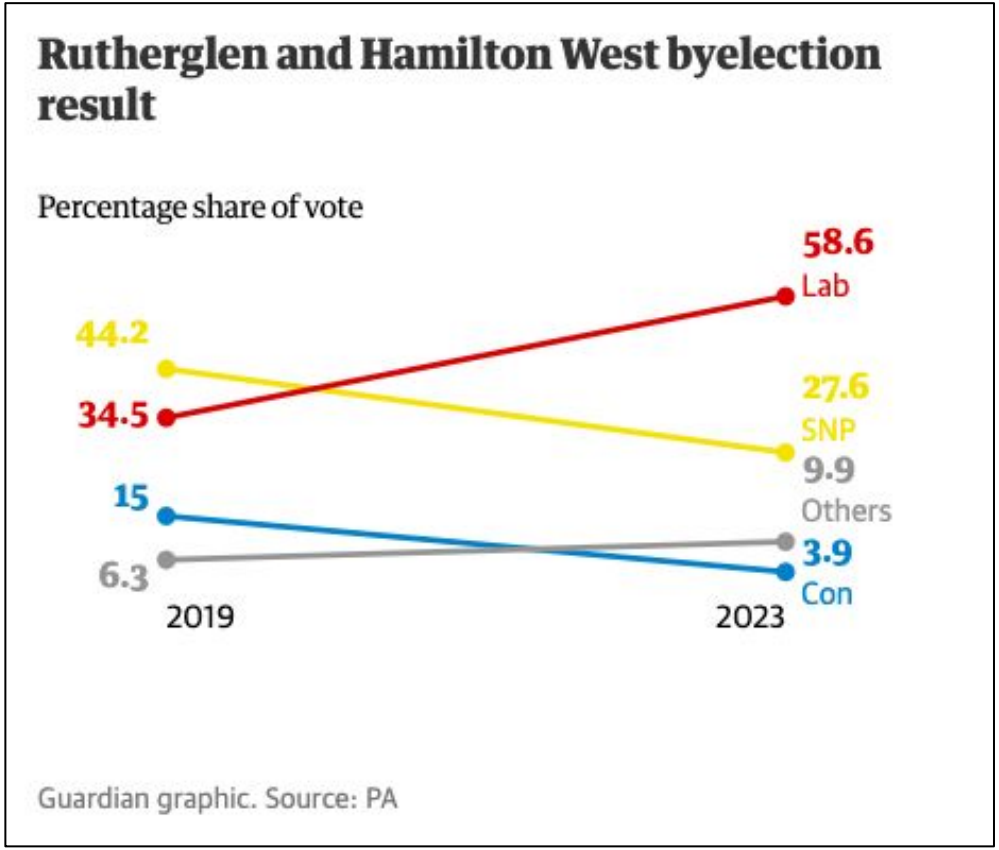


Line charts: Trends

Column charts:
Values and comparisons through time

Data through time

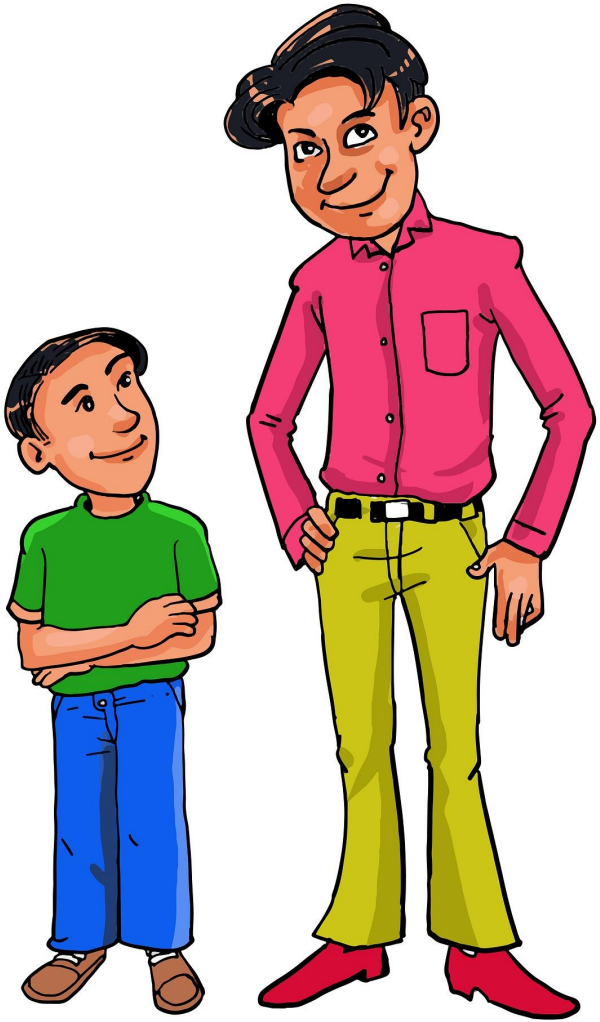
This is particularly useful for sources of data which don't provide continuous data points (eg. surveys).



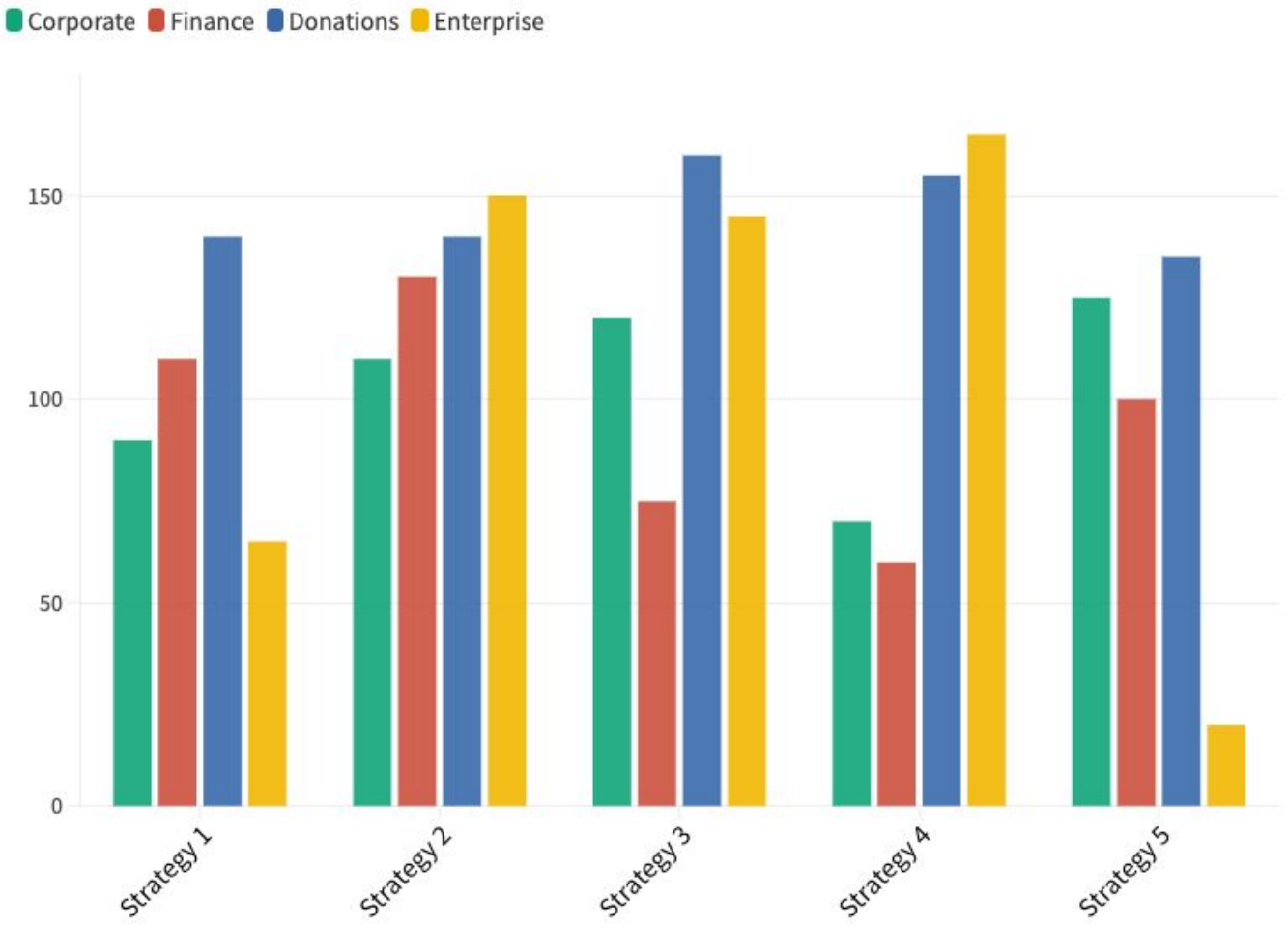
Slope charts

Comparisons

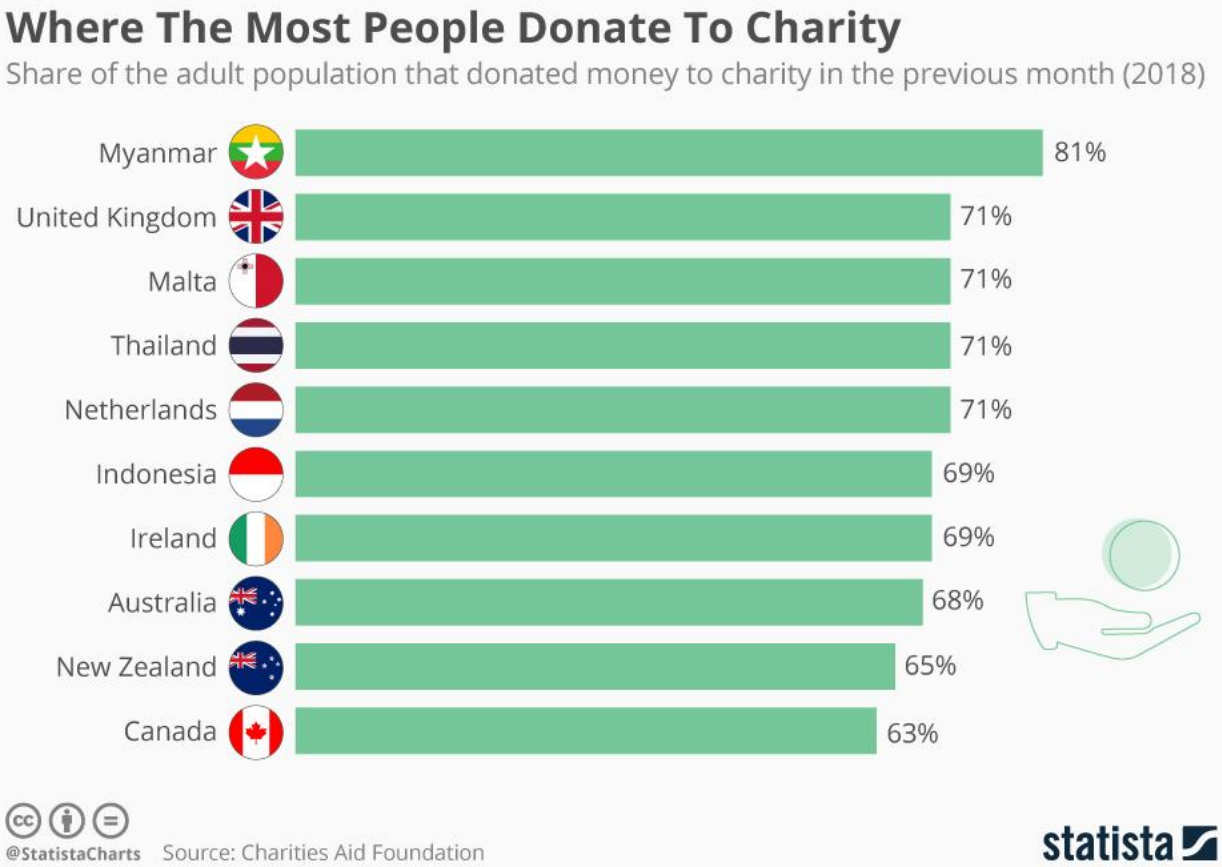
Which graph or chart type would we use?



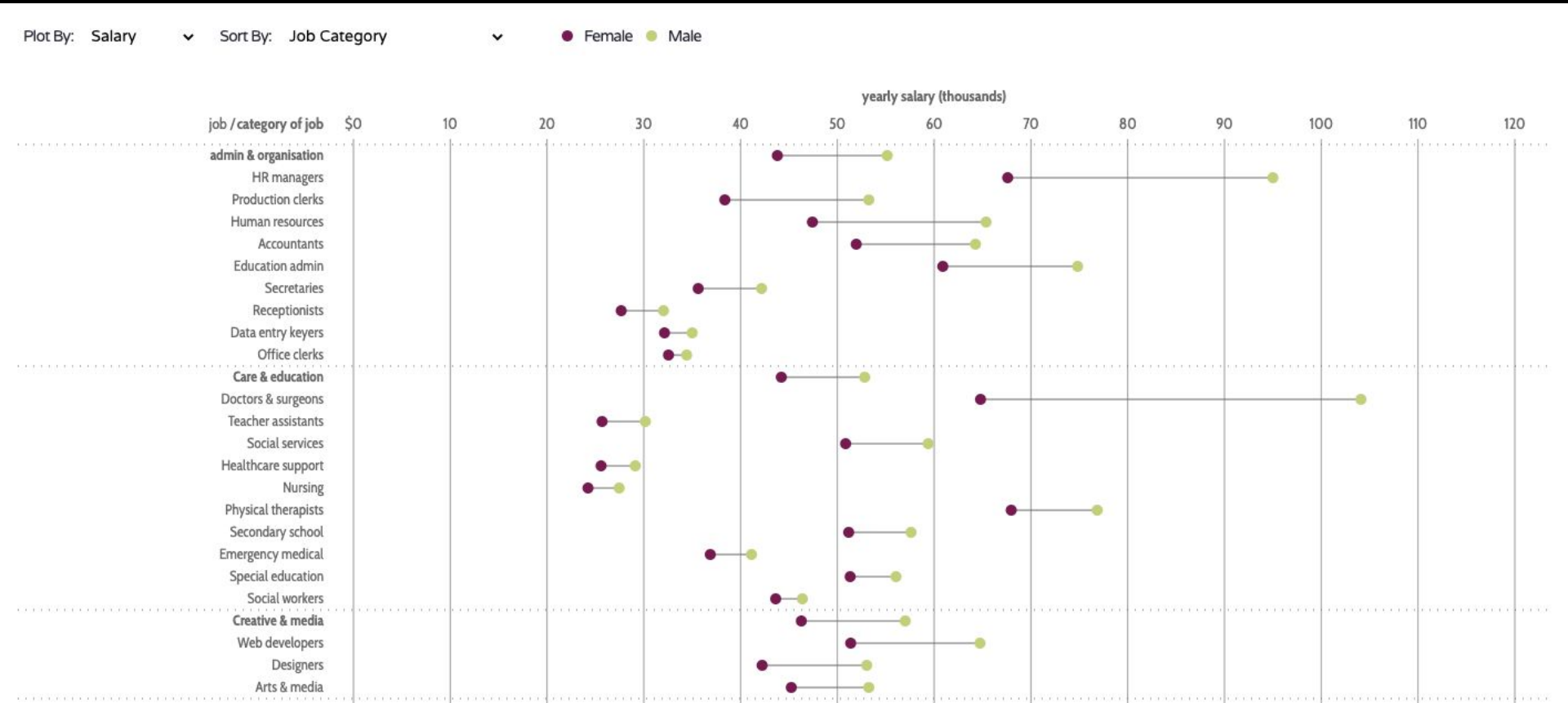
Column charts: side-by-side comparisons



Bar charts
Ranking data points



Dumbbell charts: differences

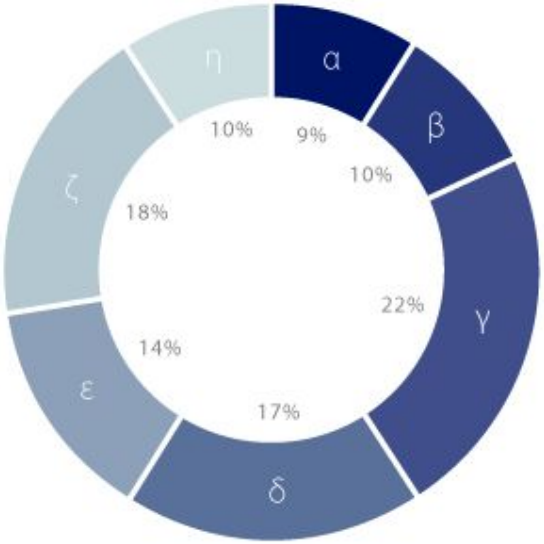


Composition

Which graph or chart type would we use?

APP CATEGORY MARKET SHARE FOR ALL DEVICES

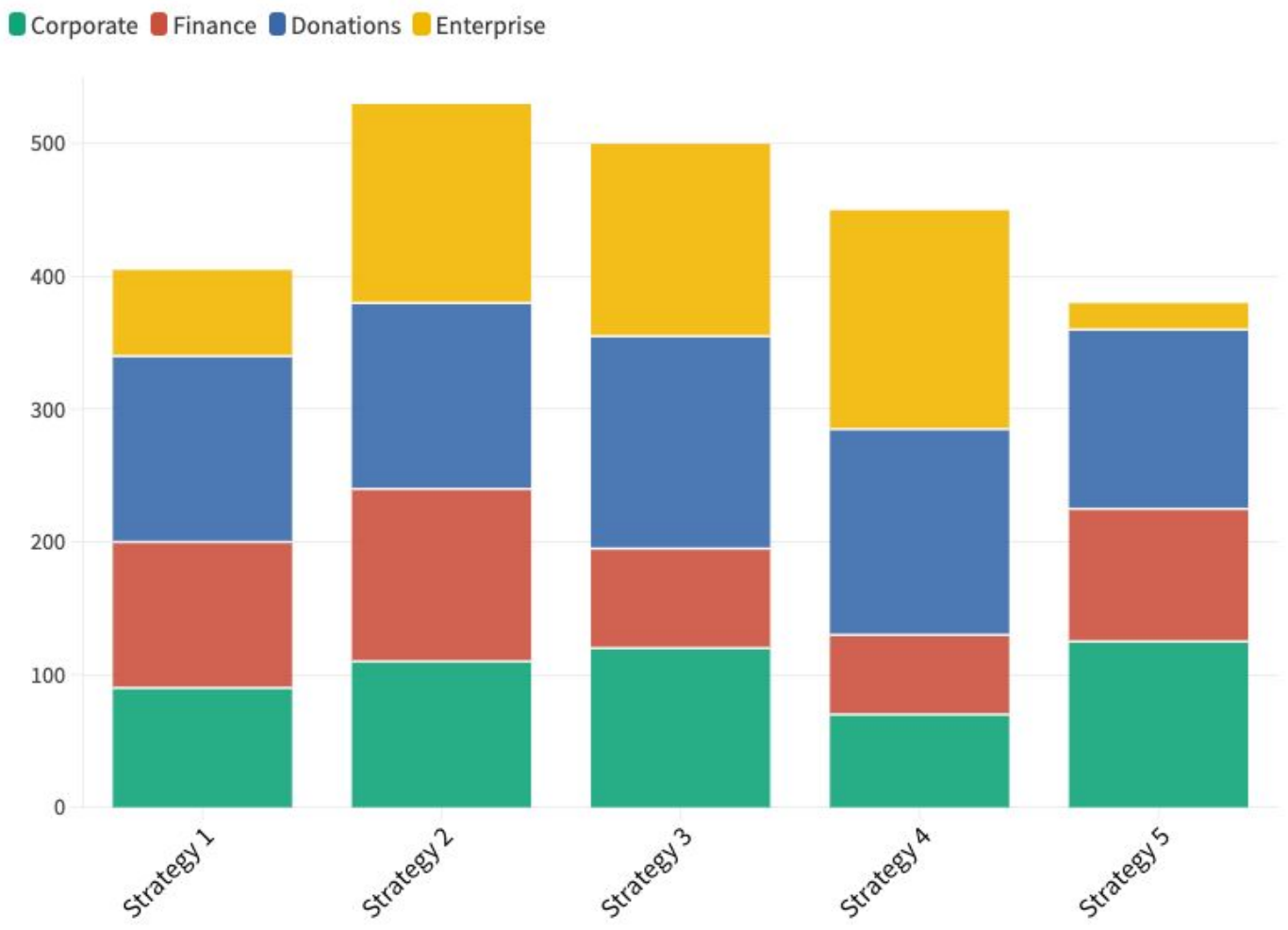
- Games (23%)
- Entertainment (11%)
- Utilities (10%)
- Education (7%)
- Productivity (5%)
- Book (5%)
- Lifestyle (5%)
- Reference (4%)
- Healthcare & fitness (4%)
- Travel (4%)
- Music (3%)
- Navigation (3%)
- Sports (3%)
- Business (3%)
- Finance (3%)
- Photography (2%)
- Social Networking (2%)
- News (1%)



Pie charts and donut charts:

Snapshot in time, less than five categories, one larger data point

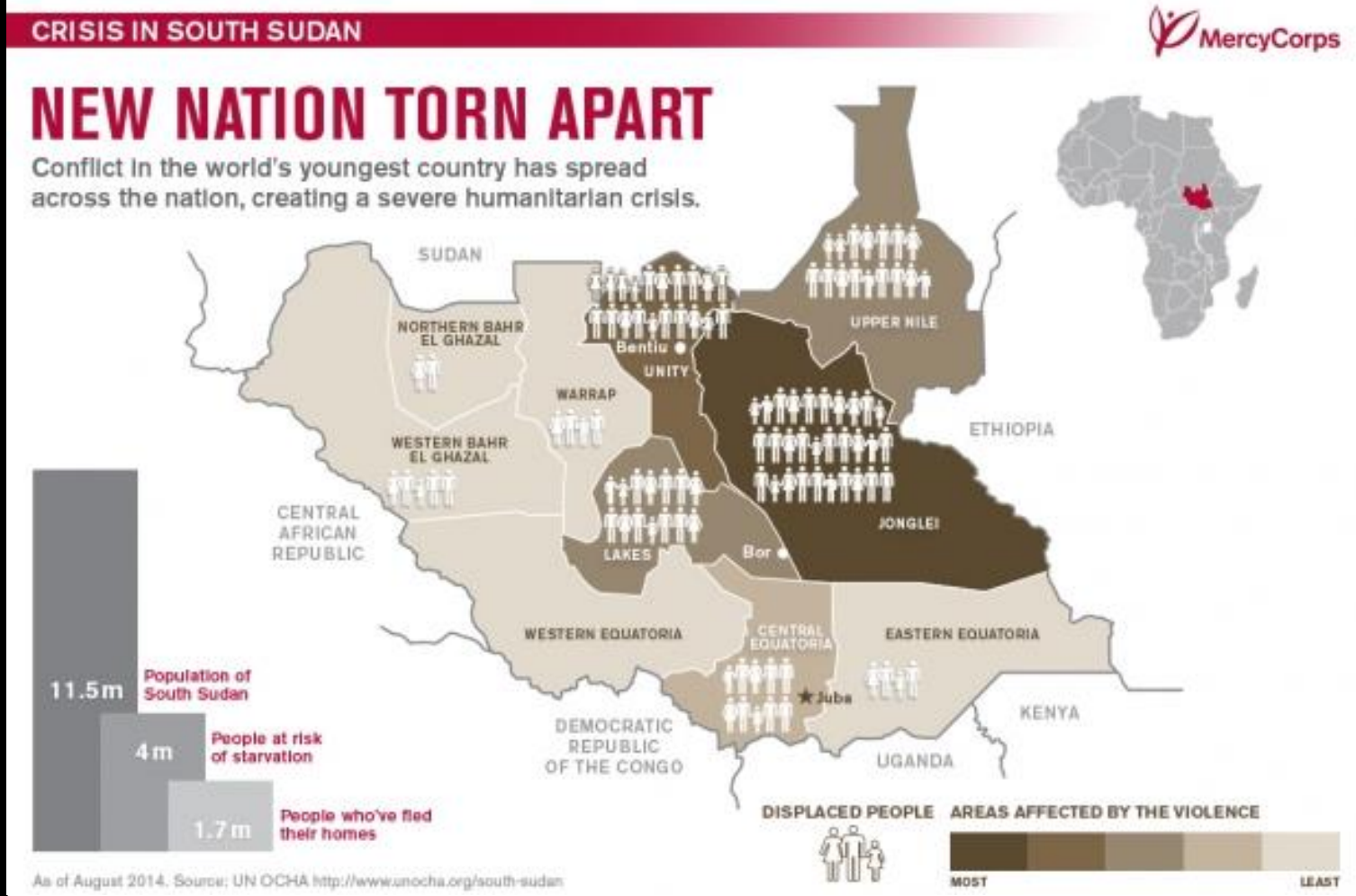
Stacked columns: Composition and total values



Treemaps:
Relative sizes, hierarchy

Waffle charts: Percentages or proportion of total

Maps: Geographic data



Icons with numbers

Always make sure these have context included (eg. comparisons, percentages).

Our World in Data

Chickens
8.9 billion factory-farmed (99.97%)
3.6 million not factory-farmed

Farmed fish
520 million factory-farmed (100%)
0 not factory-farmed

Egg-laying hens
362 million factory-farmed (98%)
7 million not factory-farmed

Turkeys
285 million factory-farmed (99.9%)
430,000 not factory-farmed

Exercise:

Choosing graphs and charts

Open the data sets in the Exercise 2 tab of the Google Sheet.

Think about which type of graph or chart will display the data best.

In **Flourish**, create a chart, and copy and paste the data across.

When you're happy with the result, you can download the chart as an image, and then upload it to **Padlet**.

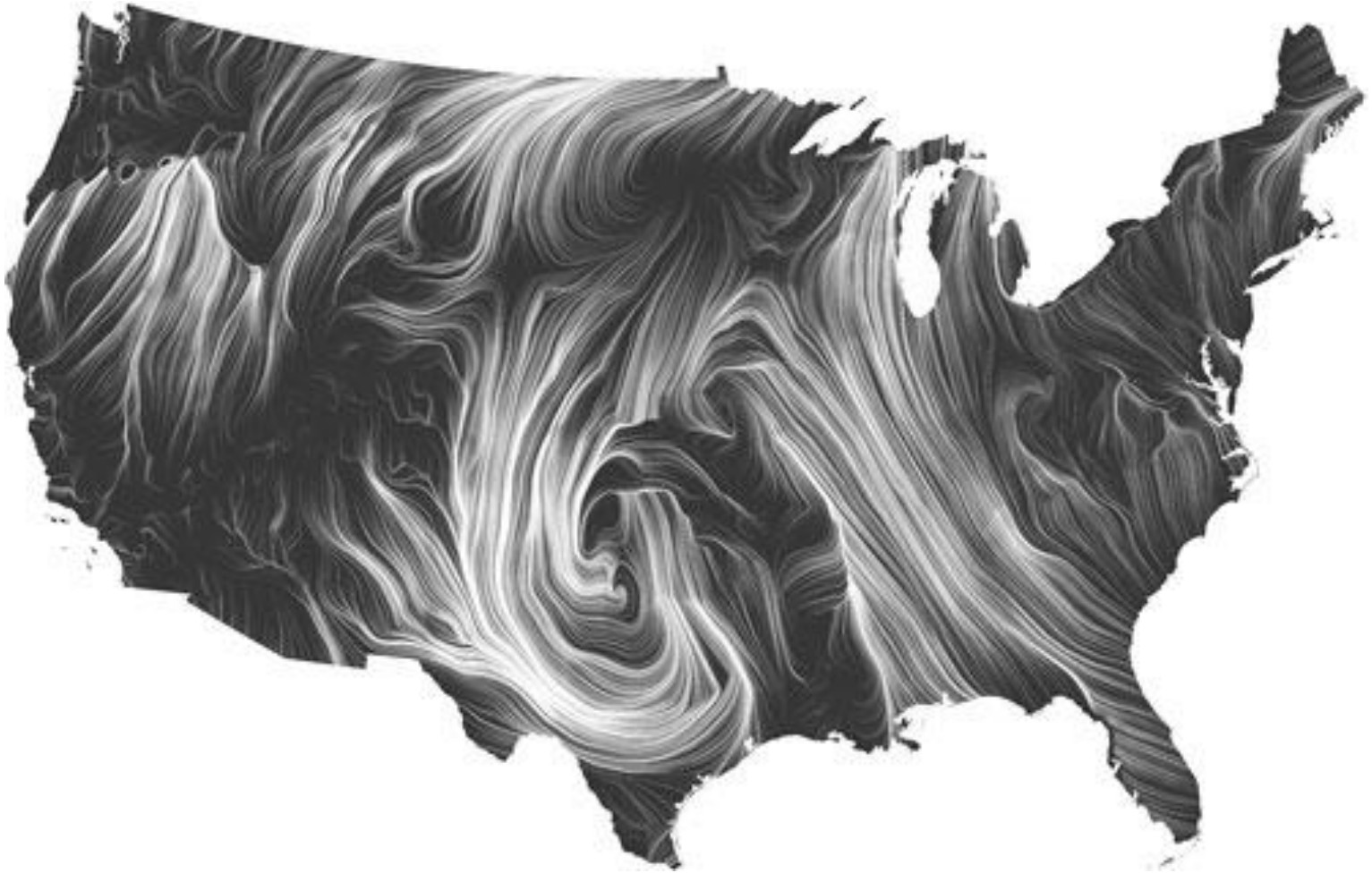
Let’s take a break

(No need to leave the meeting!)

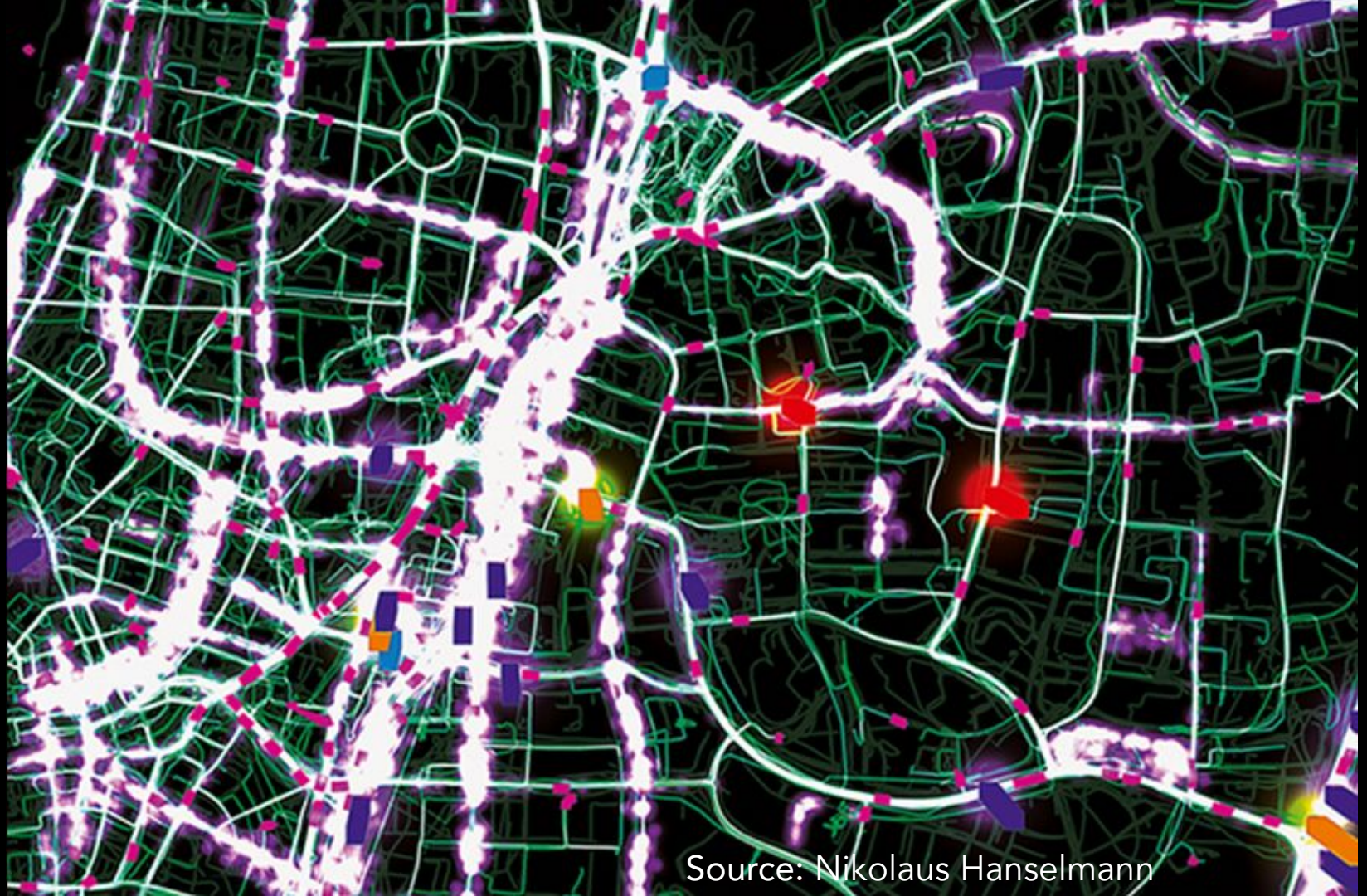
Designing for humans

“Simplify, then exaggerate”

Geoffrey Crowther, editor, The Economist



Source: Fernanda Viégas and Martin Wattenberg



Source: Nikolaus Hanselmann

6 2 5 3 9 8 8 2 7 0 5 0 3 6 7 5 9 6 2 3

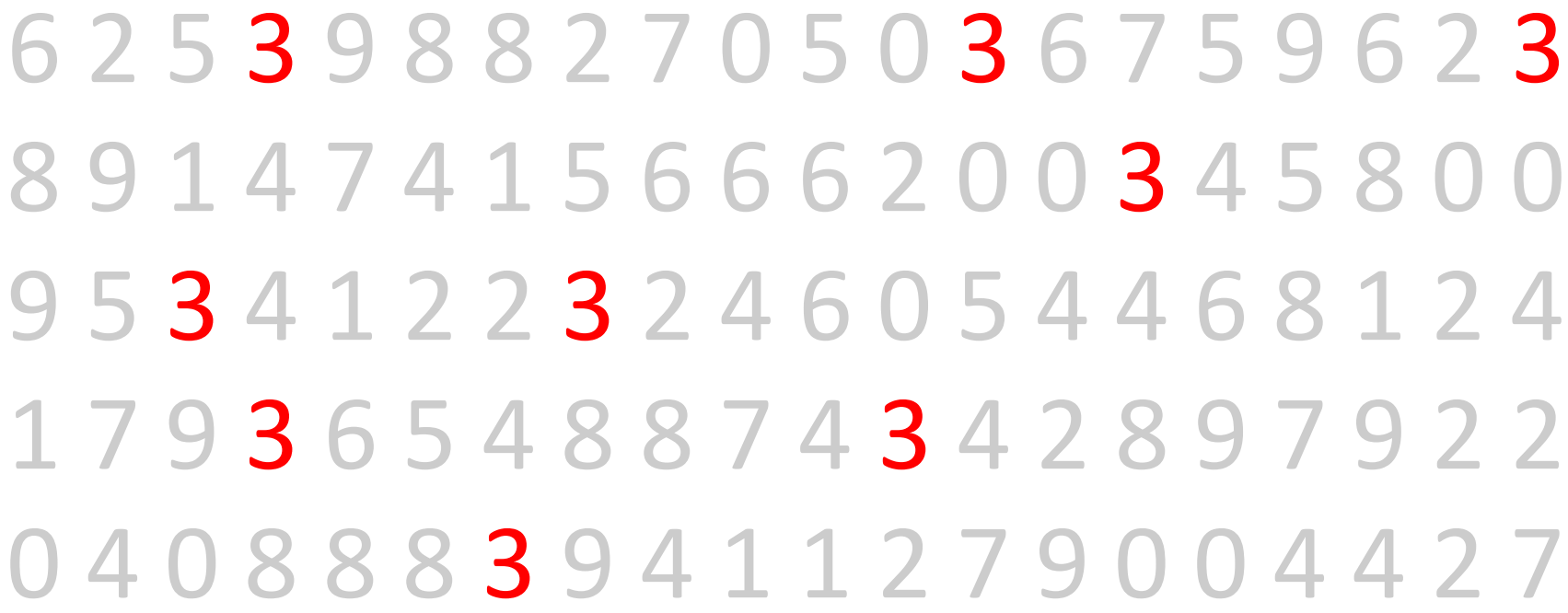
8 9 1 4 7 4 1 5 6 6 6 2 0 0 3 4 5 8 0 0

9 5 3 4 1 2 2 3 2 4 6 0 5 4 4 6 8 1 2 4

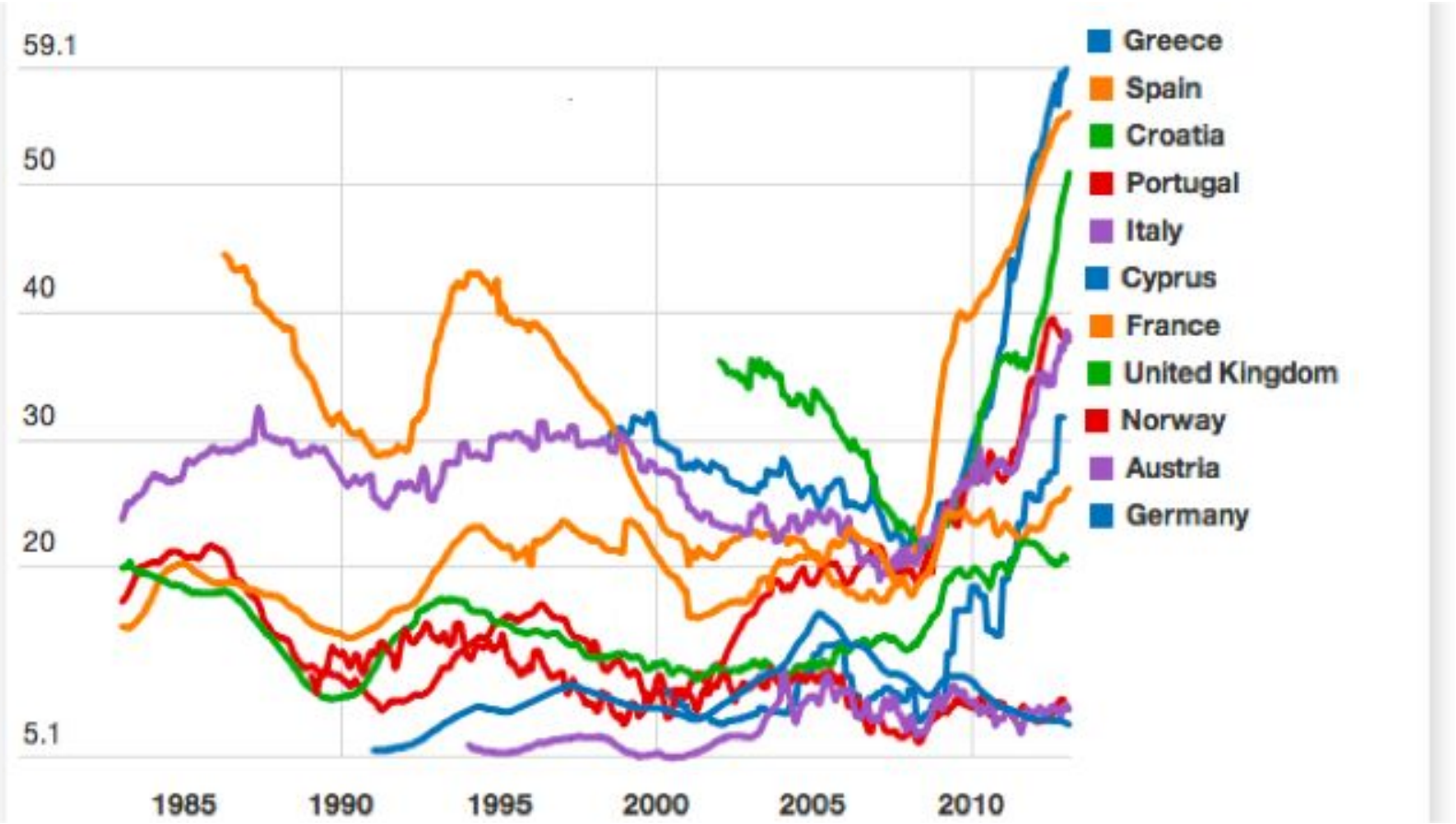
1 7 9 3 6 5 4 8 8 7 4 3 4 2 8 9 7 9 2 2

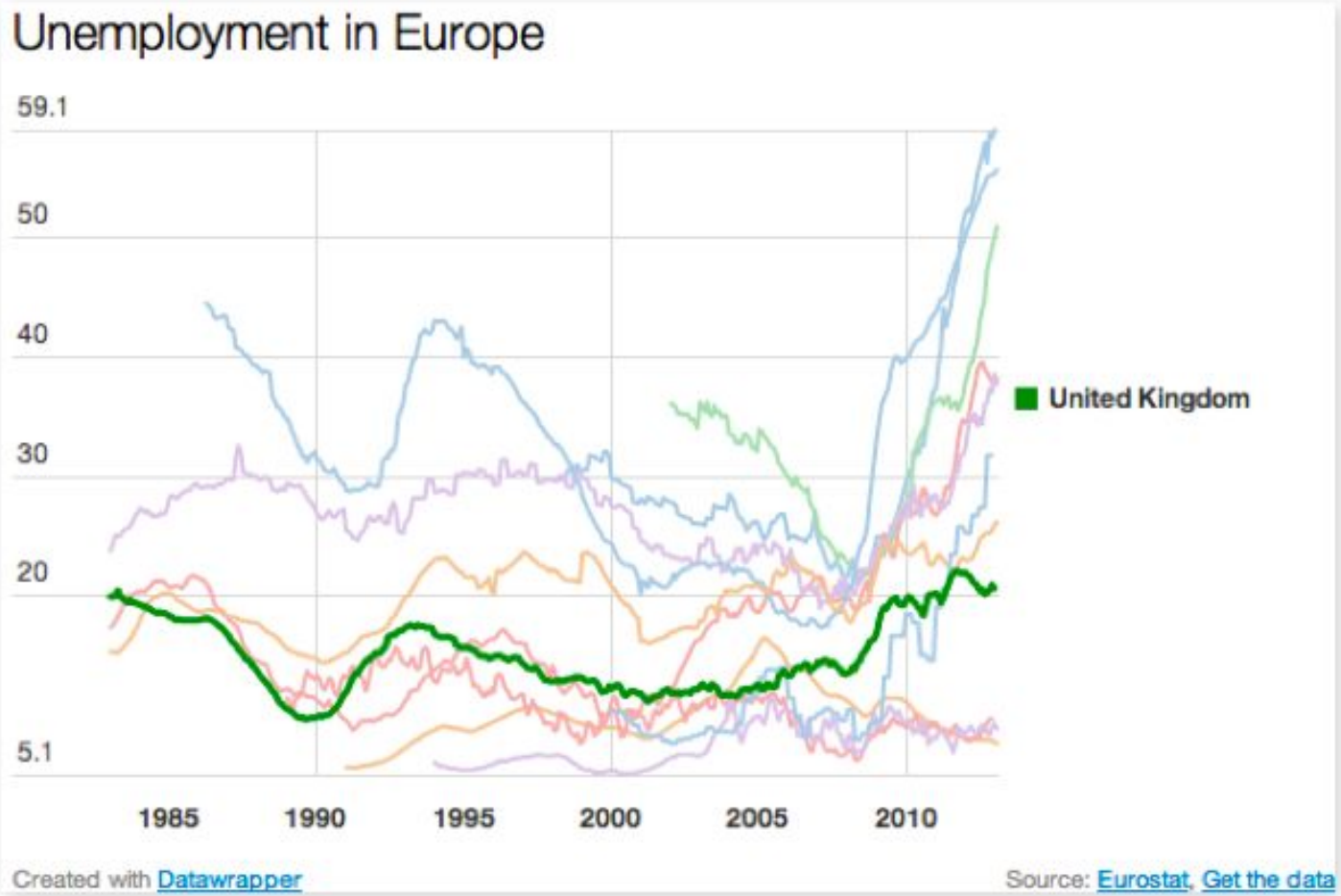
0 4 0 8 8 8 3 9 4 1 1 2 7 9 0 0 4 4 2 7

How many threes?

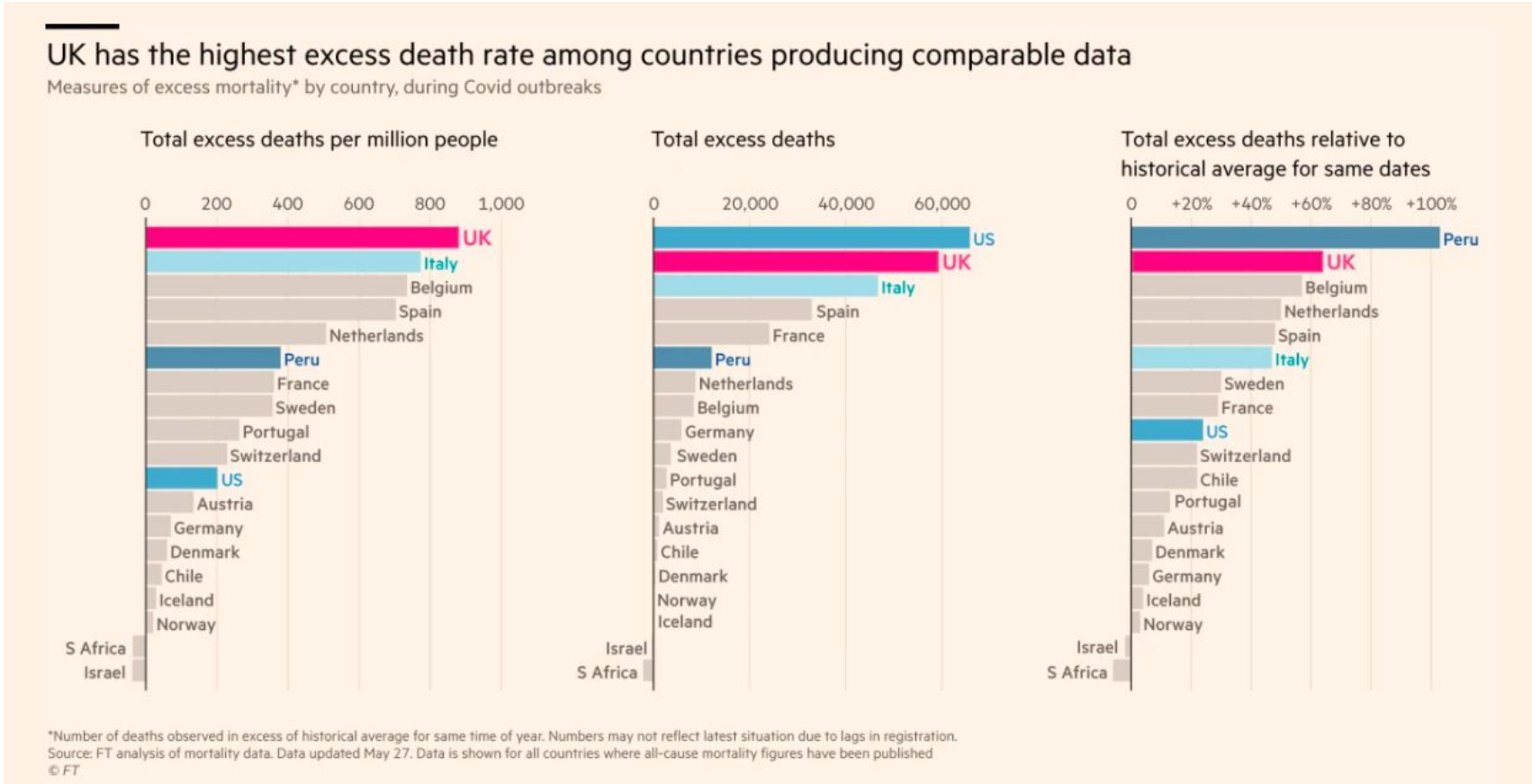


Now how many threes?


59.1
50
40
30
20
5.1
1985
1990
1995
2000
2005
2010
Greece
Spain
Croatia
Portugal
Italy
Cyprus
France
United Kingdom
Norway
Austria
Germany


Unemployment in Europe
59.1
50
40
30
20
5.1
1985
1990
1995
2000
2005
2010
United Kingdom
Created with Datawrapper
Source: Eurostat, Get the data

Use storytelling text

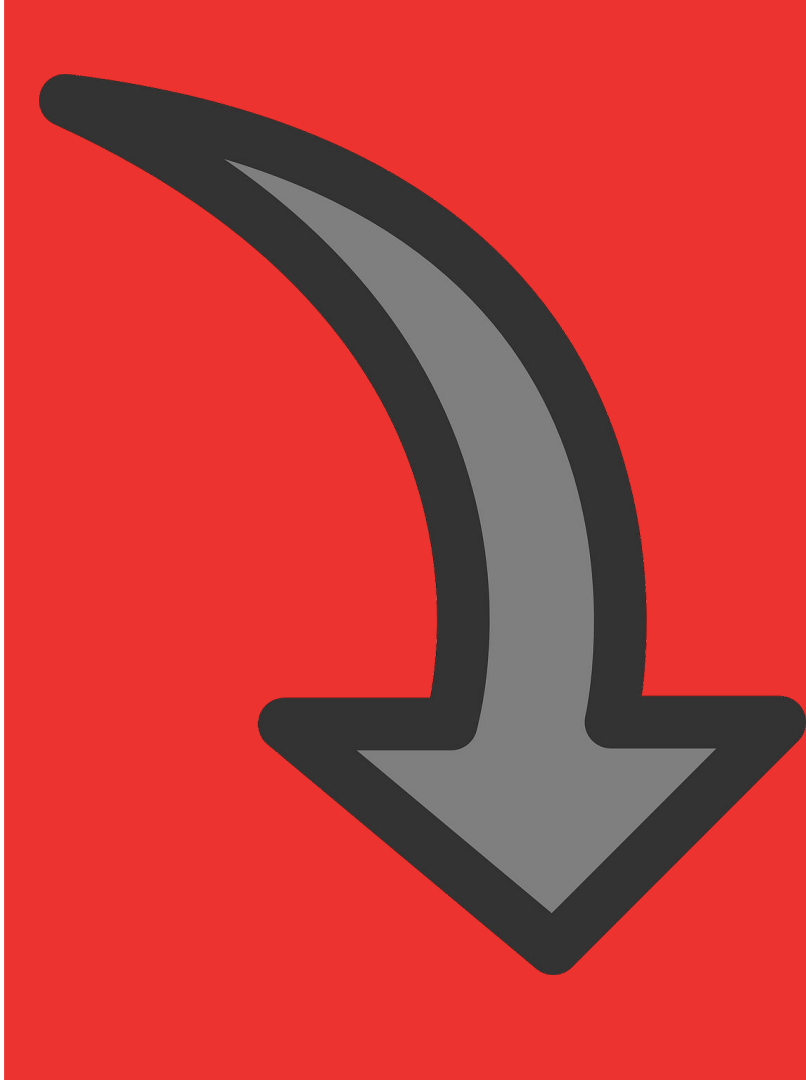


Use of colours

boutique

Position

- Generally, higher up means more important.
- Place the most important info at the top.
- Some people may skip to the end.
- Place your call to action at the bottom.



Size

And you will read this last

You will read this first

And then you will read this

Then this one

Main story (the point of the infographic)

Visual one

Visual 2

Visual 3

Visual 4

Visual 5

Images

Photographer Heather Hazzan
American Academy of Pediatrics SELF magazine

Photograph: VCG/VCG via Getty Images

Qualitative data

- Thematic coding.
- Quotes.
- Case studies.
- Illustrations and infographics.

Guns and gun safety

What Texans said in a June 2017 University of Texas/Texas Tribune Poll:

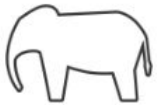
Gun control laws should be ...

Numbers may not add up to 100 due to rounding. Margin of error ± 2.83 percentage points.

What Democrats think

"We strongly support enacting sensible gun laws to curtail the availability of weapons with extended ammunition magazines, including rapid-fire, magazine-fed, military-style assault weapons."

Read the full Democratic platform



What Republicans think

"We support constitutional carry legislation through any legislative means so law-abiding citizens may carry any legally owned guns openly or concealed, while maintaining the option of a permit for reciprocity purposes only."

Read the full Republican platform

Exercise:

Adding text and styling

Open the data set in the Exercise 3 tab of the Google Sheet.

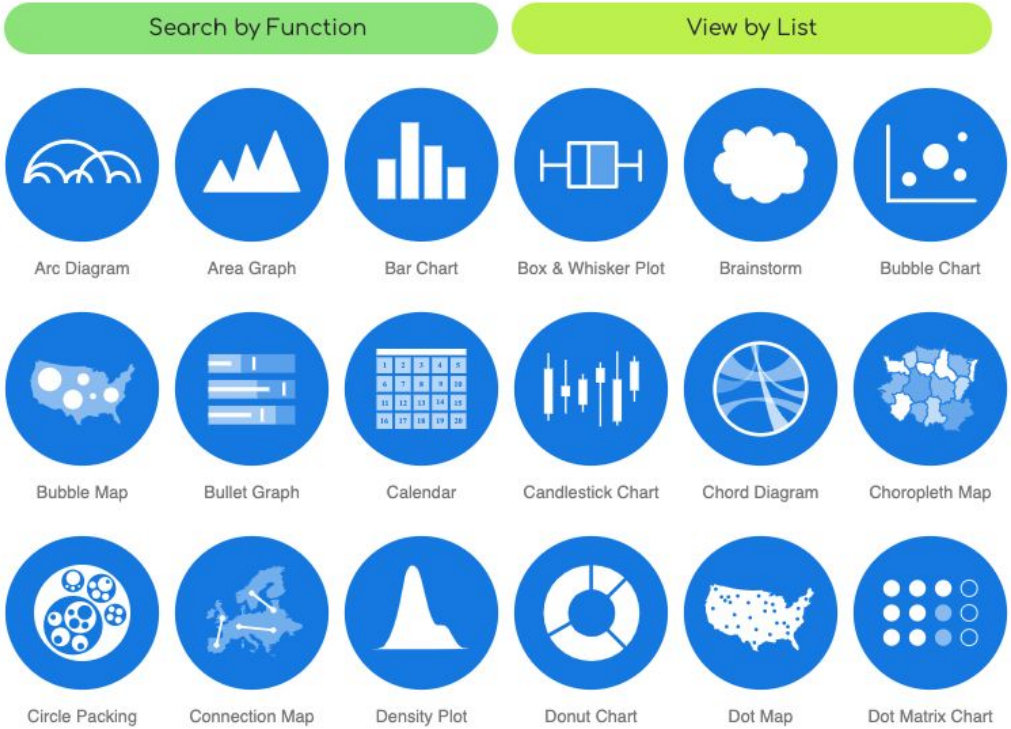
In **Flourish**, create a bar chart or column chart and copy the data into it.

Make changes to the colours and text to tell more of a story with the chart.

When you're happy with the result, you can download the chart as an image, and then upload it to **Padlet**.

Tools and resources

Data Visualisation Catalogue

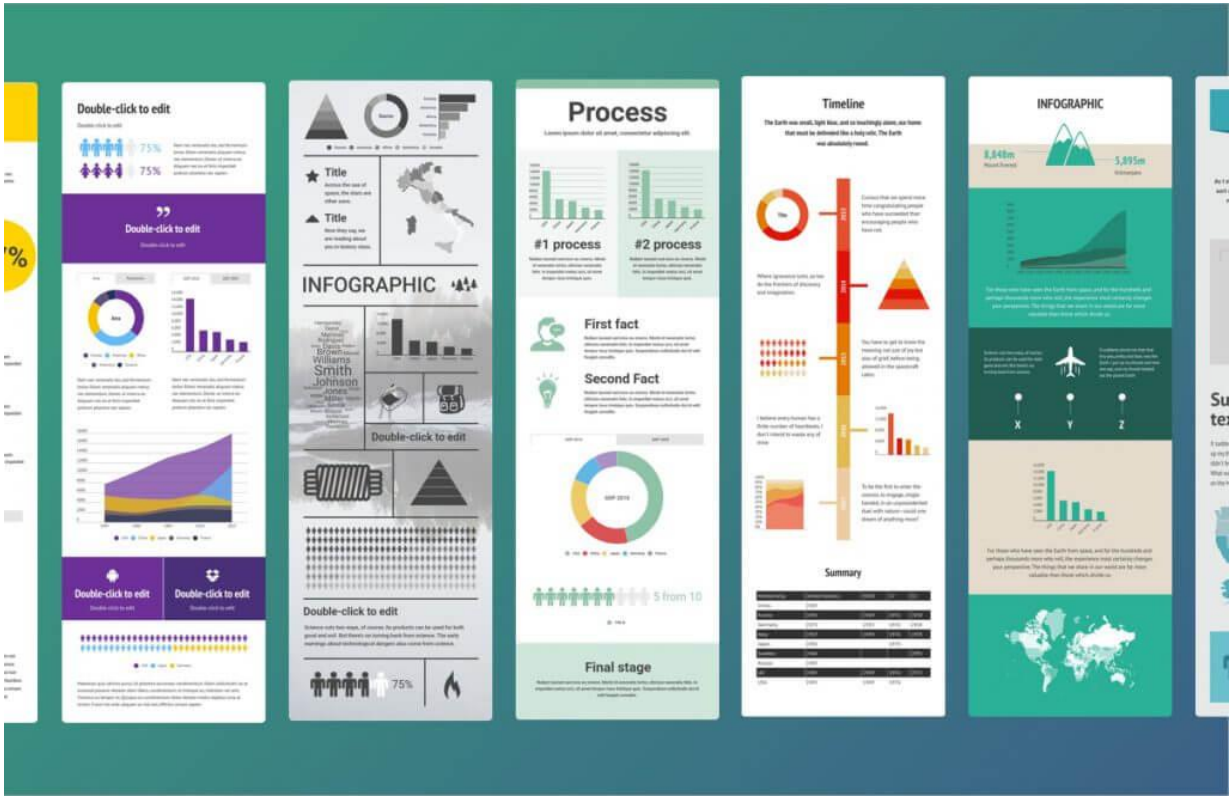


datavizcatalogue.com

Financial Times Visual Vocabulary

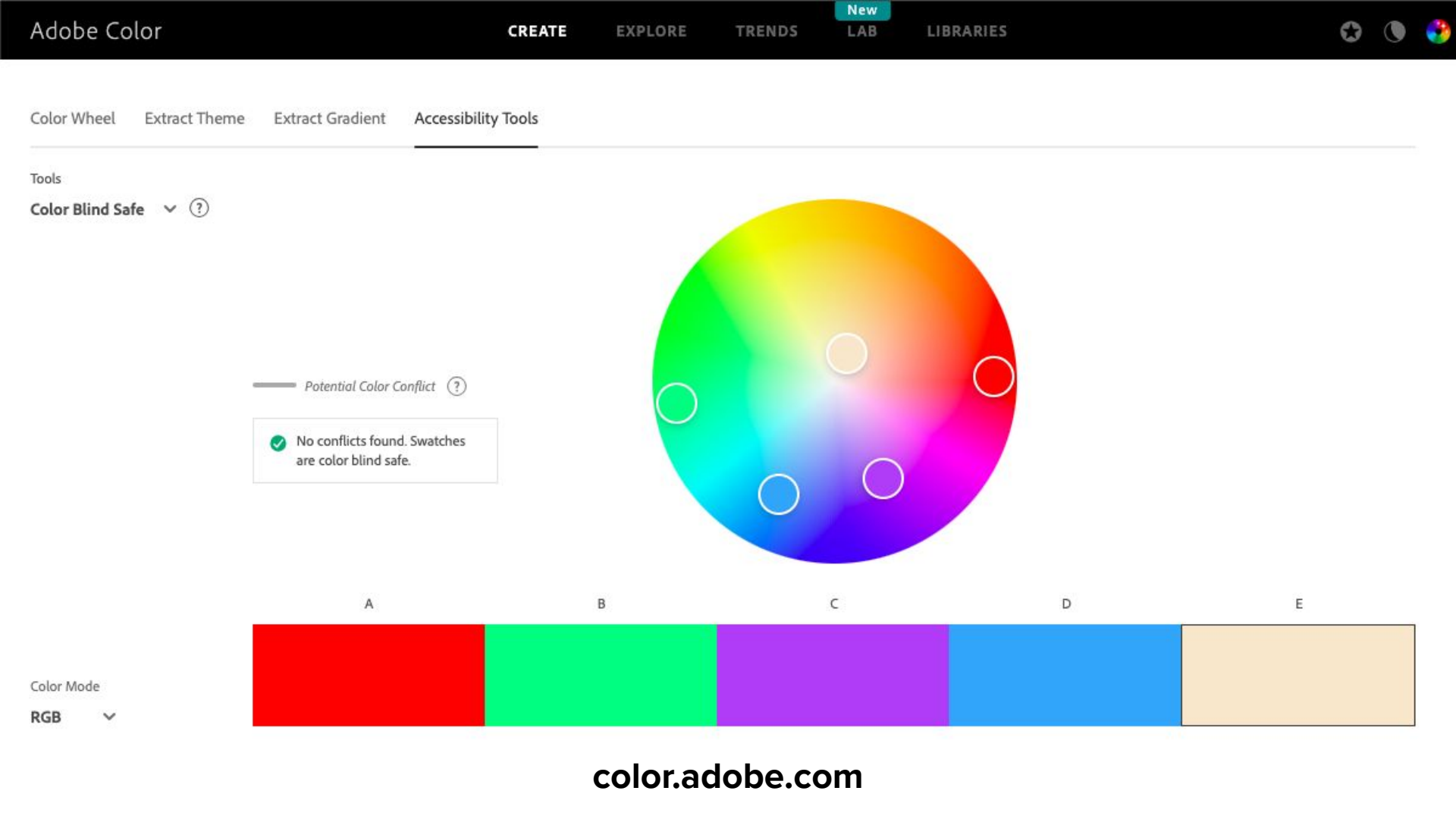
Creating infographics

- Infogram
- Venngage
- Piktochart
- Canva
- Infographia



Images, icons and pictograms

- Pexels
- Pixabay
- Unsplash
- Flaticon
- Noun Project


Adobe Color
CREATE
EXPLORE
TRENDS
New
LAB
LIBRARIES
Color Wheel
Extract Theme
Extract Gradient
Accessibility Tools
Tools
Color Blind Safe
Potential Color Conflict
No conflicts found. Swatches are color blind safe.
A
B
C
D
E
Color Mode
RGB
color.adobe.com

HOW DO I MAKE IT IN POWERPOINT?

GUIDES TO DOING INTERESTING THINGS WITH THE POWERPOINT CHARTING ENGINE

WAFFLE CHARTS WITH ICONS

Read More →

WAFFLE CHARTS (MULTIPLE SERIES)

Read More →

WAFFLE CHARTS (SINGLE SERIES)

Read More →

SPLIT CIRCLES

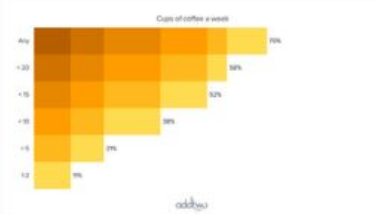
Read More →

QUADRANTS

Read More →

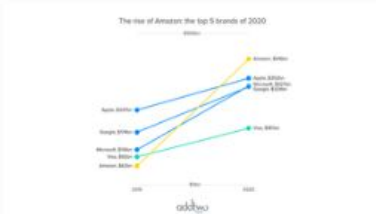
PYRAMID CHART

Read More →



PROPORTIONAL PYRAMIDS

Read More →



SLOPE CHARTS

Read More →

addtwodigital.com/powerpoint-tutorials

Summing up

Key points to remember

- Being selective about what you choose to highlight.
- Identify a clear and actionable story.
- Choosing simple charts for communication.
- Apply simple design tricks to focus on key points.

Questions?

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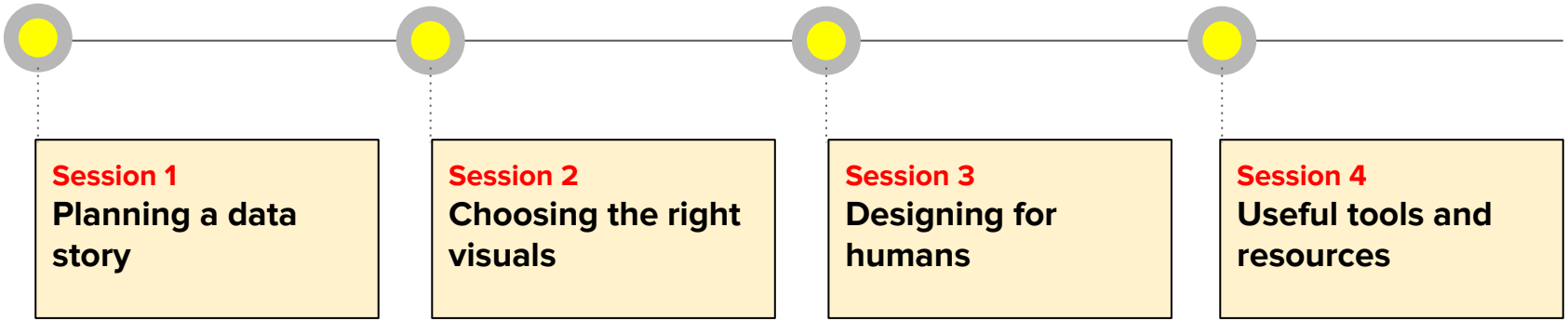
alan@fireplusalgebra.com
fireplusalgebra.com

Agenda


Session 1
Planning a data story
Session 2
Choosing the right visuals
Session 3
Designing for humans
Session 4
Useful tools and resources

“No one ever made a decision because of a number. They need a story.”

Daniel Kahneman
Author and psychologist