

Designing for your audience

Andy Kirk | visualisingdata.com | [@visualisingdata](https://twitter.com/visualisingdata)

We Mean Green.
Leave your car
at home and take
the train to cut
carbon emissions
by two thirds.
Get on board.



“I think that’s rubbish,” he said. “I could understand it if they had just swapped red for green. But why on earth have they got that many colours? It’s a load of old bollocks. It’s just a mess.”



The Guardian <https://www.theguardian.com/artanddesign/2021/sep/22/british-rail-logo-designer-appalled-by-green-makeover-mess>

I don't like it

It is too red

I don't trust it

It is too blue

I don't understand the subject

I don't want to have to click on things

I don't care about the subject

I want to be able to click on things

I don't have time to read it

It is too detailed

I don't know how to read it

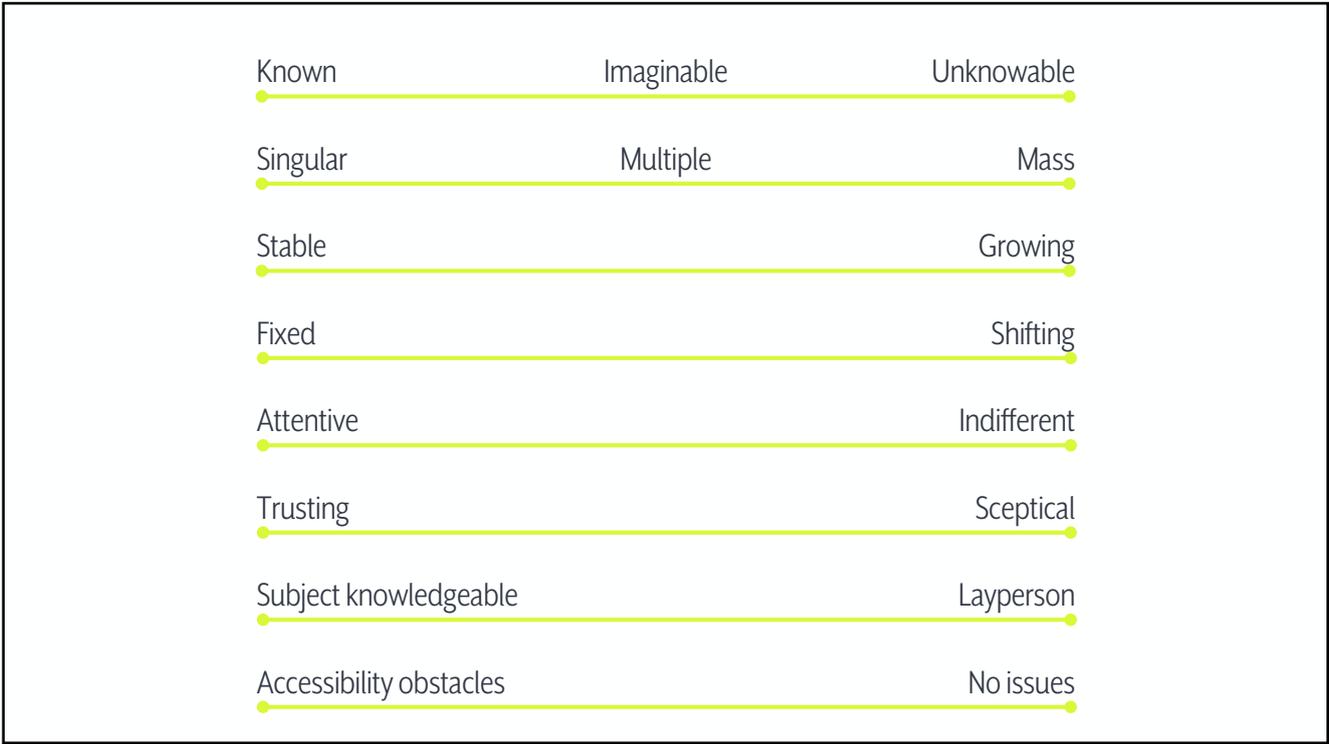
It is too simplistic

It doesn't show what I want to know

It is boring

WHO ARE THEY?

Characterising your audience



*People compiling job descriptions /
Researchers interested in the methods used*

2

EXPLORE **X** EXPLAIN

We simulate the election 40,000 times to see who wins most often. The sample of 100 outcomes below gives you a good idea of the range of scenarios our model thinks is possible.

Neil, this is Houston. Did you get the Houston...

**“Diljit from Amritsar” / “Joe in New York”
Gurman’s Mum**

02:30

REGIONAL PARTIES

05-06 06-07 07-08 08-09

12-13 13-14 15-16 16-17

1850 1860 1870 1880

good ill improvement stone

1850 1860 1870 1880

turn volume reader boiler

1850 1860 1870 1880

EXPLORE  EXPLAIN

I am universe.

We simulate the election 40,000 times to see who wins most often. The sample of 100 outcomes below gives you a good idea of the range of scenarios our model thinks is possible.

Neil, this is Houston. Did you get the Houston...

**Over 8s | Science-curious | Experienced by
parent & child, learning together**

02:30

REGIONAL PARTIES

05-06 06-07 07-08 08-09

12-13 13-14 15-16 16-17

1850 1860 1870 1880

good ill improvement stone

1850 1860 1870 1880

turn volume reader boiler

1850 1860 1870 1880

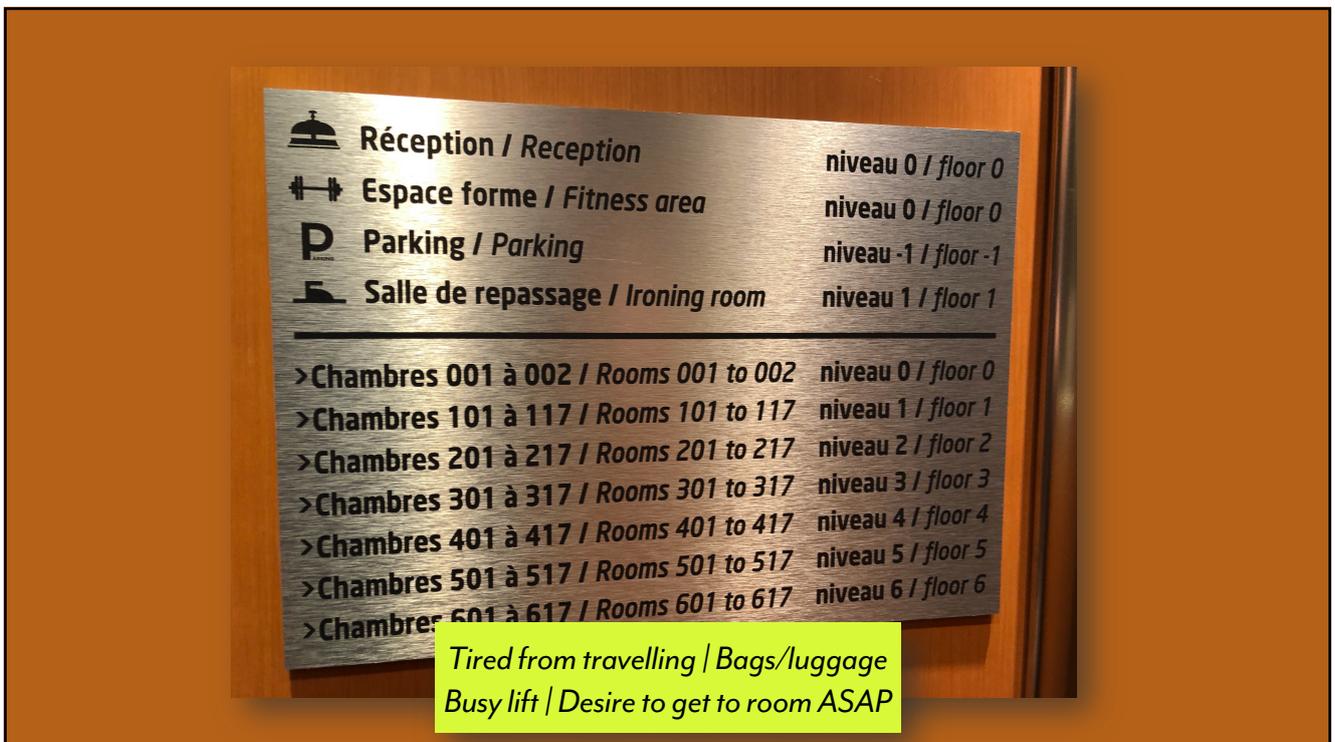
EXPLORE  EXPLAIN

I am universe.

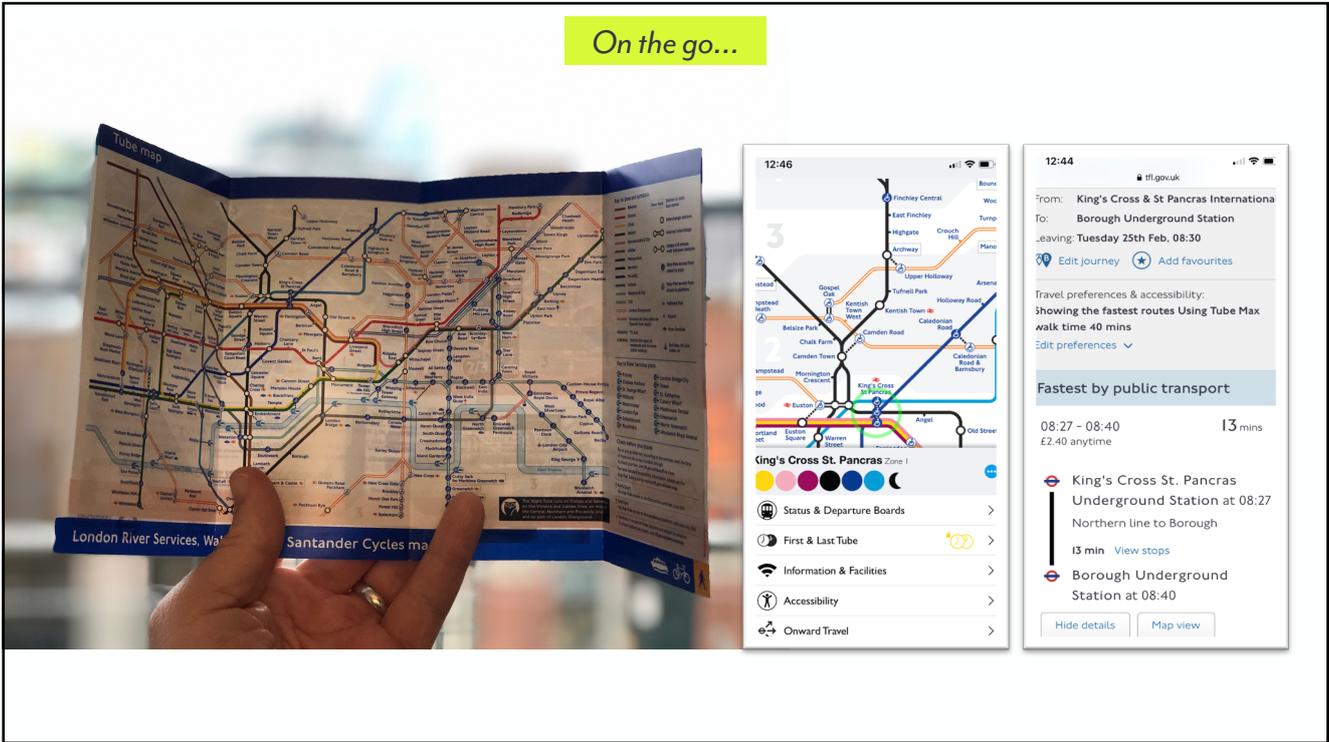


HOW WILL THEY ENCOUNTER IT?

Characterising the 'where' and 'when'

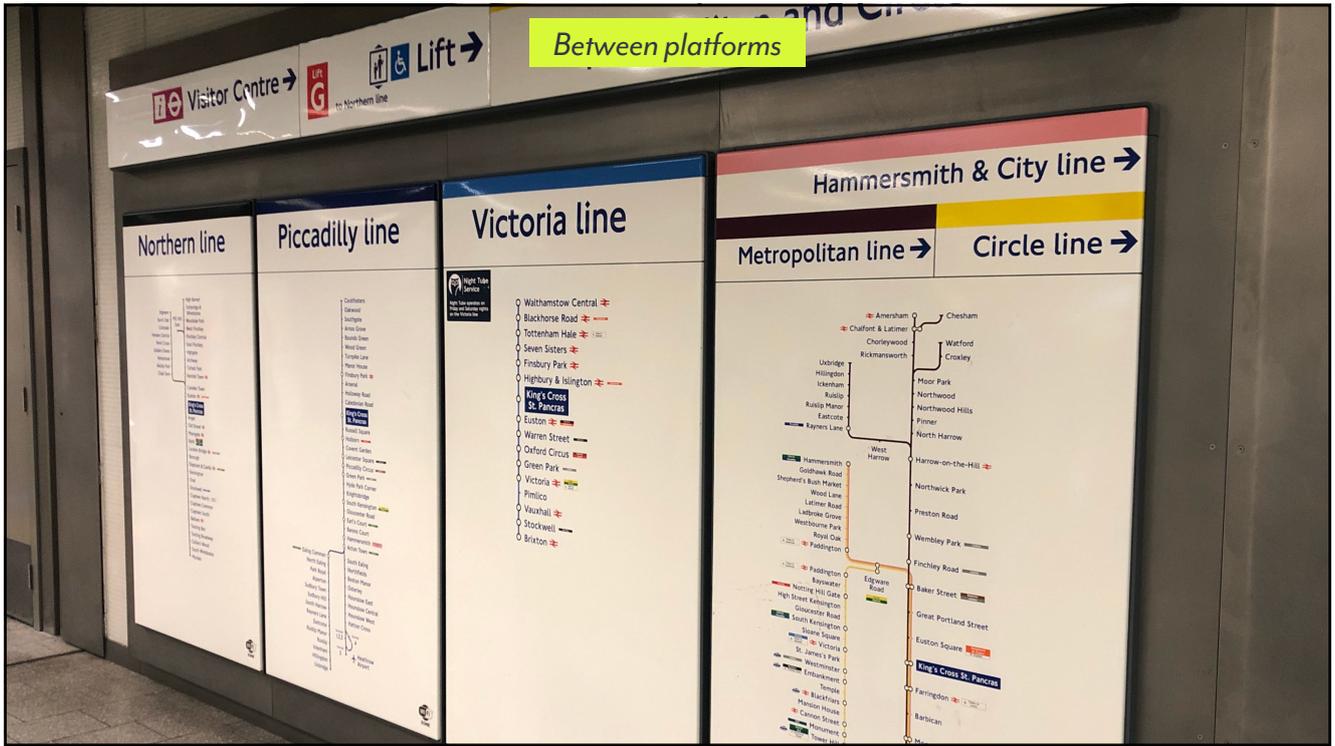


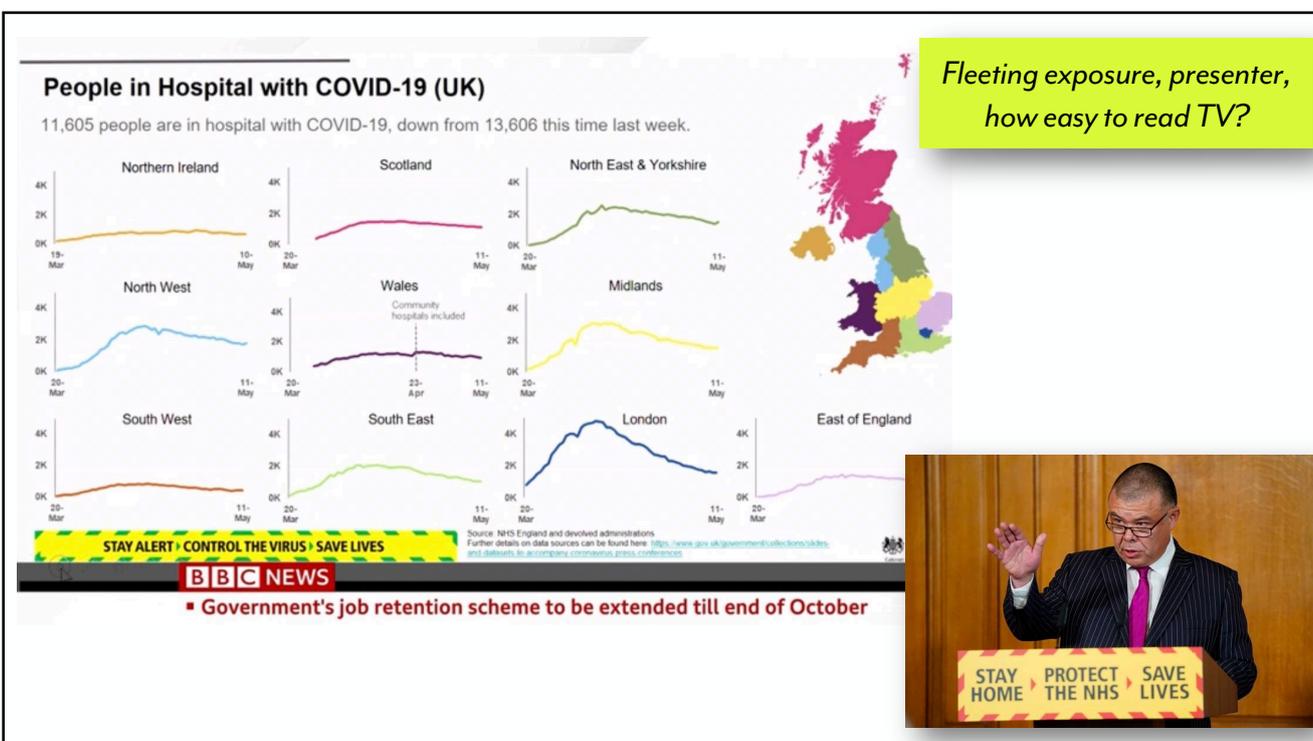
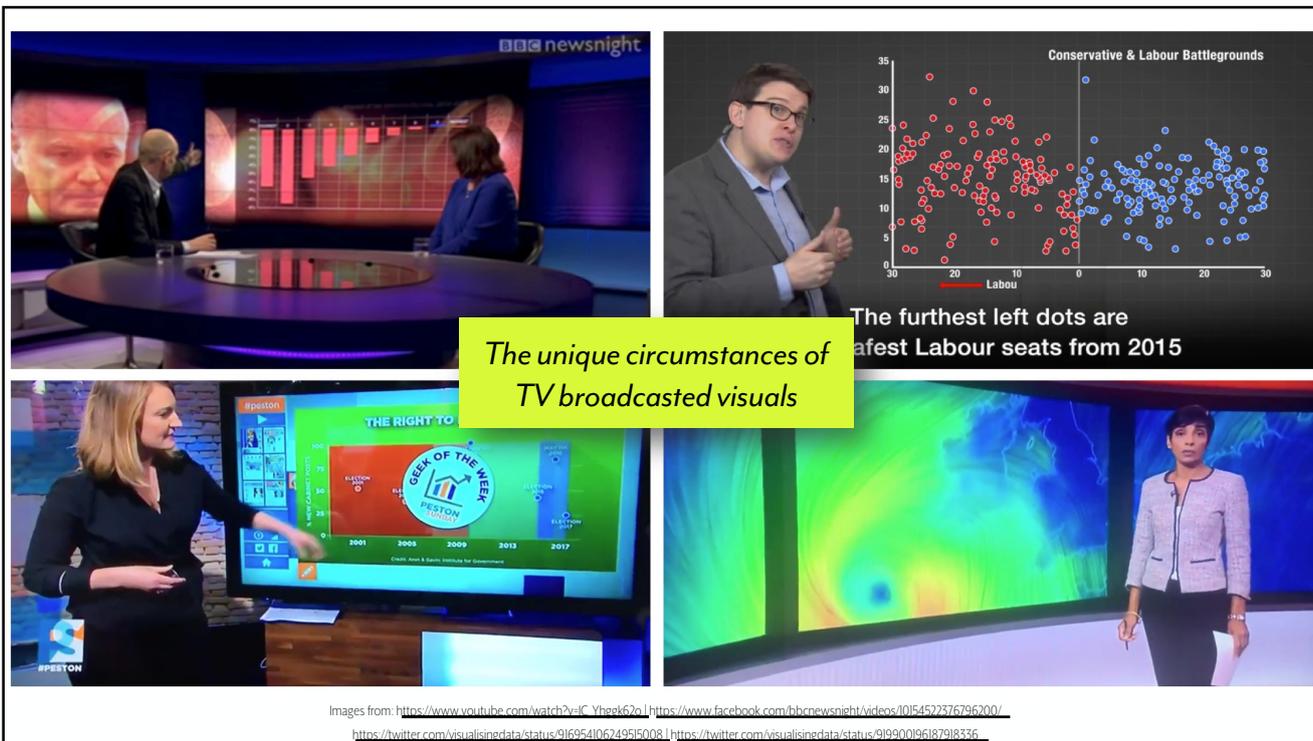
On the go...



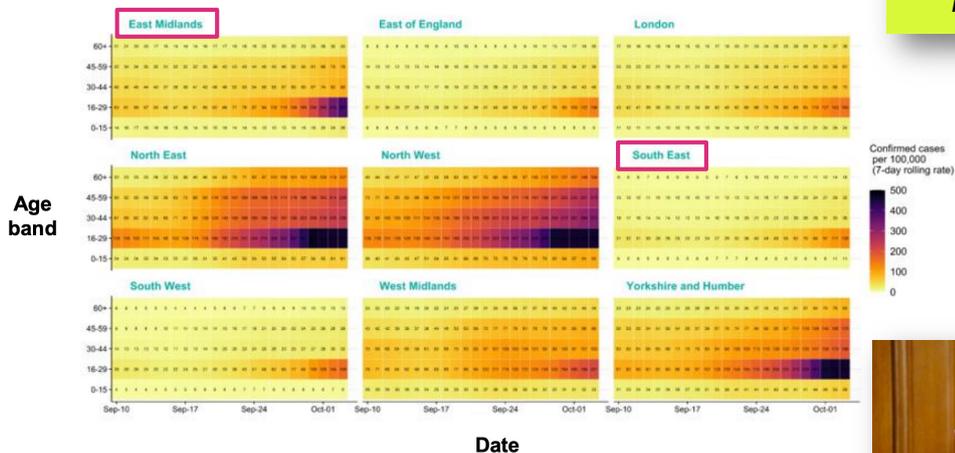
At the station







Age-specific confirmed case rate England regions

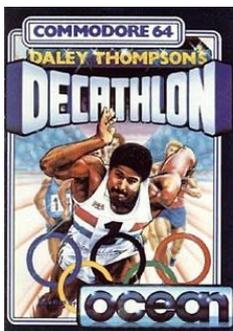


Source: Case data from SGSS. Produced by Outbreak Surveillance Team, PHE
Contains National Statistics data © Crown copyright and database right 2020

*Fleeting exposure, presenter,
how easy to read TV?*



UK Government <https://www.gov.uk/government/publications/nhs-data-briefing-12-october>



*How often? Learning through
frequent usage/exposure...*



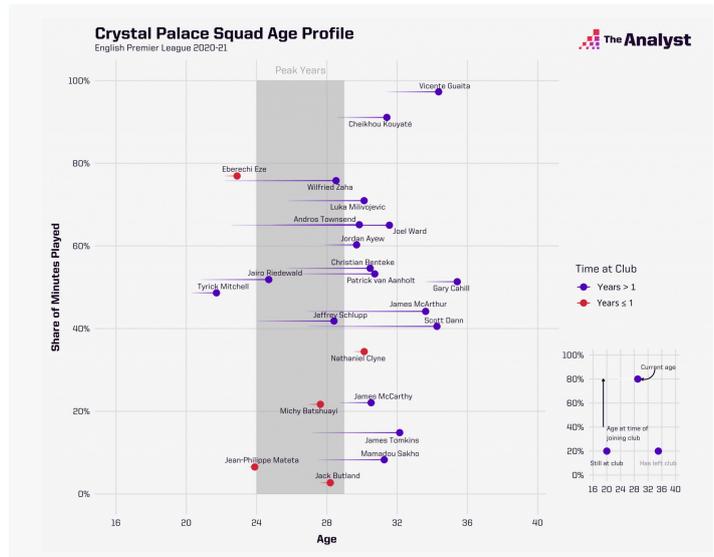
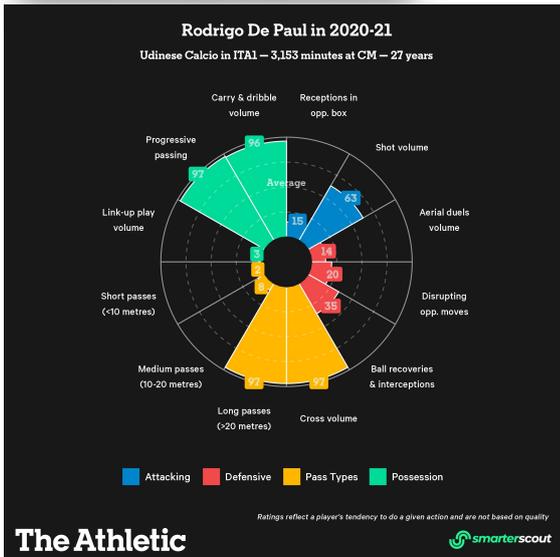
How often? Learning through frequent usage/exposure...

Daily Candlestick Chart (FTSE as at Nov 26, 2020):



Charts from <https://techniquant.com/reports/index-ftse-daily-technical-analysis-report-for-2019-04-02/> & <http://diagrammm.com/candlestick-chart>

How often? Learning through frequent usage/exposure...



The Athletic https://theathletic.com/2806857/2021/09/05/beyond-the-big-moves-the-most-interesting-transfer-windows-and-strategies-in-europes-top-five-leagues/?source=shared_article | The Analyst <https://theanalyst.com/en/2021/05/the-analysis-may-16/>



WHAT UNDERSTANDING ARE YOU FACILITATING?

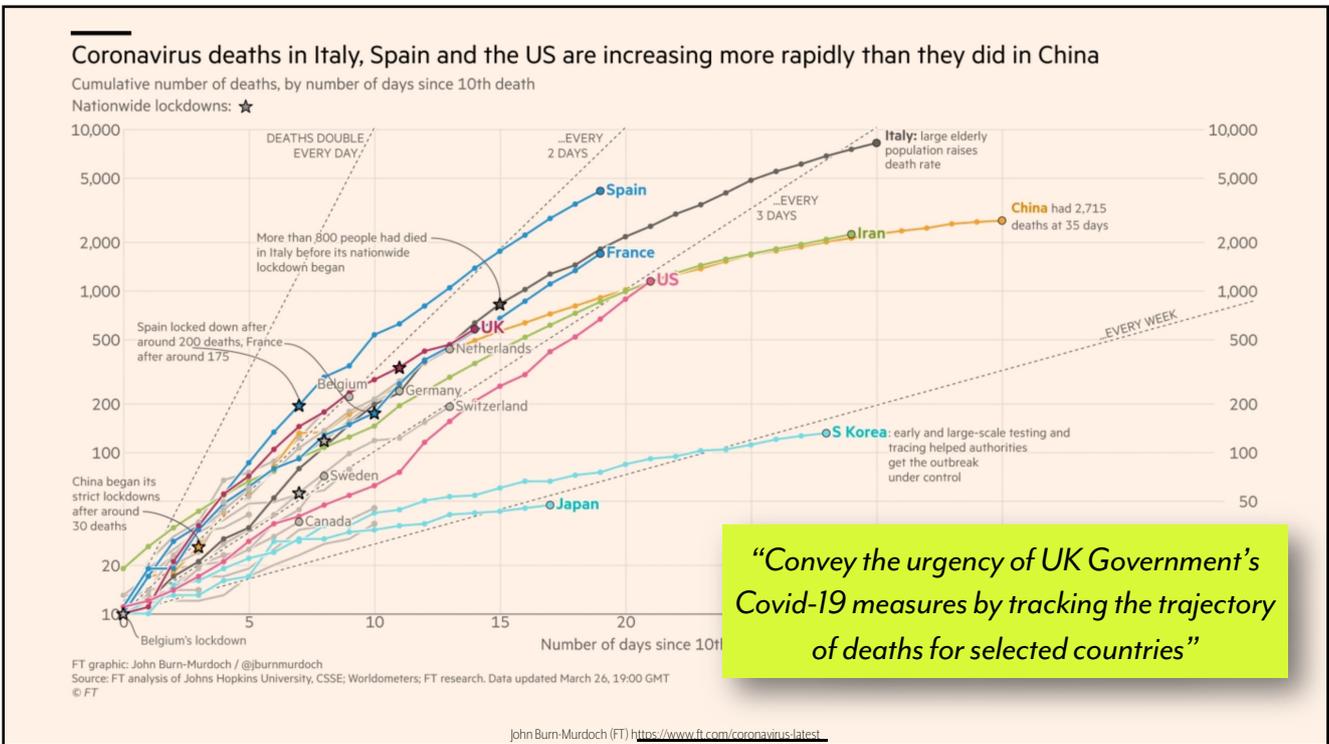
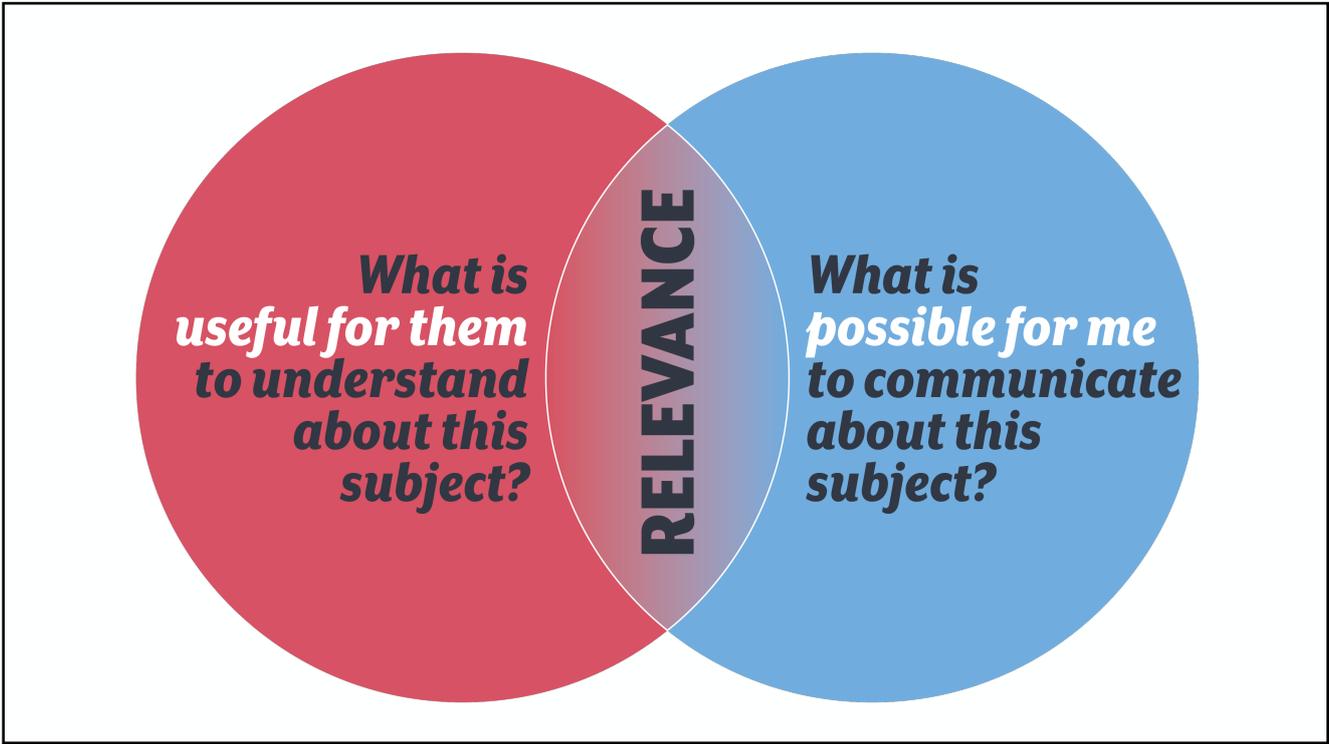
Communicating relevant content



	Réception / Reception	niveau 0 / floor 0
	Espace forme / fitness area	niveau 0 / floor 0
	Parking / Parking	niveau -1 / floor -1
	Salle de repassage / Ironing room	niveau 1 / floor 1
<hr/>		
	Chambres 001 / 002 / Rooms 001 to 002	niveau 0 / floor 0
	Chambres 101 / 117 / Rooms 101 to 117	niveau 1 / floor 1
	Chambres 201 / 217 / Rooms 201 to 217	niveau 2 / floor 2
	Chambres 301 / 317 / Rooms 301 to 317	niveau 3 / floor 3
	Chambres 401 / 417 / Rooms 401 to 417	niveau 4 / floor 4
	Chambres 501 / 517 / Rooms 501 to 517	niveau 5 / floor 5
	Chambres 601 / 617 / Rooms 601 to 617	niveau 6 / floor 6

Chambres Rooms	Niveau Floor	Installations Facilities
601 - 617	6	
501 - 517	5	
401 - 417	4	
301 - 317	3	
201 - 217	2	
101 - 117	1	🪵
001 - 002	0	🚰 🏋️
	-1	🅅







The Tube Map does not answer...
 "How do I get from **The Shard** to
Lord's Cricket Ground?"

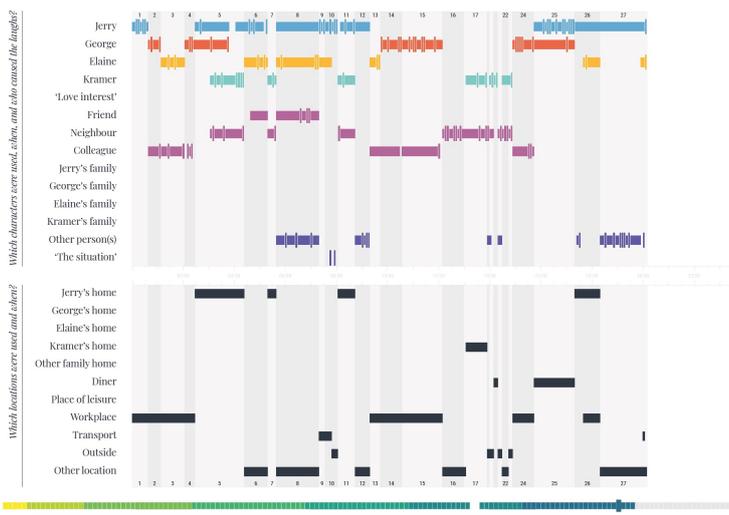
The Tube Map does answer...
 "How do I get from **London Bridge** station to
St John's Wood station?"

s7e21

"The Bottle Deposit (Part 1)"

A garage mechanic steals Jerry's car. Elaine tries to win J. Peterman 37th's presidential bid (thru an auction). George is asked to work on a mysterious assignment. Diner and Newman run a recycling scam.

#131
 May 2, 1994



Visualising the Rhythm and Texture of Seinfeld



What would someone like you find relevant?

Andy Kirk <https://www.visualisingdata.com/2020/09/new-project-the-seinfeld-chronicles/>

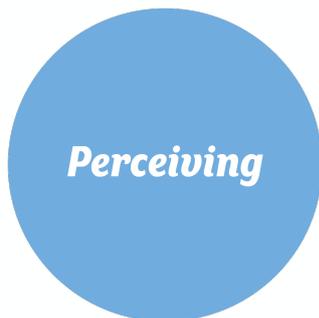


WHAT ARE THEIR CAPABILITIES?

Reduce obstacles to understanding



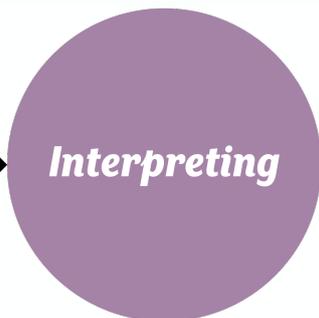
Reducing obstacles to understanding



Perceiving

What do I see?
What is charted? How is the data visually represented?
What features are observable?

VISUALISER CONTROL



Interpreting

What does it mean?
Given the subject matter, what features are most interesting, significant? What's good/bad?



Comprehending

What does it mean to me?
What have I learnt?
What do I feel?
What do I now do?

VIEWER CONTROL

SOUNDCLOUD Home Stream Library Search for artists, bands, tracks, podcasts Sign in Create account Upload

Reducing obstacles to understanding

transportforlondon
2016 Part 1 Disk 1 Track 5: Circle line
 In playlist: TfL Audio Guide...

Comments are disabled for this track.

Like Repost Share Add to Next up More

Follow **transportforlondon** and others on SoundCloud.
 Create a SoundCloud account Sign in

audio guide

Next up

- transportforlondon 2016 Part 1 Disk 1 Track 5: Circle line
- transportforlondon 2016 Part 1 Disk 1 Track 6: District line 9:31
- transportforlondon 2016 Part 1 Disk 1 Track 7: Hammersmith & City line 5:01
- transportforlondon 2016 Part 1 Disk 1 Track 8: Jubilee line 3:39
- transportforlondon 2016 Part 1 Disk 1 Track 9: Other Transport for London audio p... 1:04
- transportforlondon 2016 Part 1 Disk 2 Track 1 1:51
- transportforlondon 2016 Part 1 Disk 2 Track 2: Metropolitan line 6:51
- transportforlondon 2016 Part 1 Disk 2 Track 3: Northern line 8:29
- transportforlondon 2016 Part 1 Disk 2 Track 4: Piccadilly line 6:37
- transportforlondon 2016 Part 1 Disk 2 Track 5: Victoria line 3:05
- transportforlondon 2016 Part 1 Disk 2 Track 6: Waterloo & City line 0:41
- transportforlondon 2016 Part 1 Disk 2 Track 7: Docklands Light Railway 4:32

0:47 7:29 transportforlondon 2016 Part 1 Disk 1 Track 5: Circle line

Reducing obstacles to understanding

Data Vis Dos & Don'ts
 8 min
 November 21st, 2017

Respect your readers' time

Lisa Charlotte Muth

Sometimes, I give workshops. They are mostly introductions to data visualization. And if you've ever visited one of these workshops, you've seen this chart before:

Yearly fluctuations in area of Arctic covered by ice
 Millions of sq. km

Each line represents one yearly cycle of sea ice fluctuations
 The dotted line represents the average ice extent from 1981 to 2010

Ice extent for 2010 to 2014 is shown with green lines

Feb. 25 2015 maximum

Arctic ice cover usually reaches an annual maximum around March

Ice cover usually shrinks to its minimum in September

2012 Arctic ice extent reached the lowest point on record

WINTER SUMMER

JAN. FEB. MARCH APRIL MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

18 million sq. km
 16
 14
 12
 10
 8
 6
 4

Size of Canada
 Size of Alaska
 Size of California

Datawrapper <https://blog.datawrapper.de/category/dtavis-dos-and-donts/>

Reducing obstacles to understanding

State Overview

Filter by region

Show All

How to read this graphic

Map View

Overview

How to Read this Graphic

New Cases
New daily cases: 7-day moving average— a green line segment represents a day-over-day decrease in cases, and a red line segment represents a day-over-day increase in cases.

Weekly trend:
Trending up— from the previous week to this week the trend is going up and greater than 5%.
Trending down— from the previous week to this week the trend is going down and less than -5%.
No change— from the previous week to this week the trend is staying relatively flat (between -5% and 5%).

Tests per 1,000 people
New daily cases: 7-day moving average— a green line segment represents a day-over-day increase in testing, and a red line segment represents a day-over-day decrease in testing.

Weekly trend:
Trending up— from the previous week to this week the trend is going up and greater than 5%.
Trending down— from the previous week to this week the trend is going down and less than -5%.
No change— from the previous week to this week the trend is staying relatively flat (between -5% and 5%).

Percent Positive
Daily % positive: 7-day moving average— a green line segment is shown when below a 5% threshold, and a red line segment when above a 5% threshold.

Weekly trend:
Below threshold— the average of the percent positive moving average values from the last 7 days is below a 5% threshold.
Above threshold— the average of the percent positive moving average values from the last 7 days is above a 5% threshold.

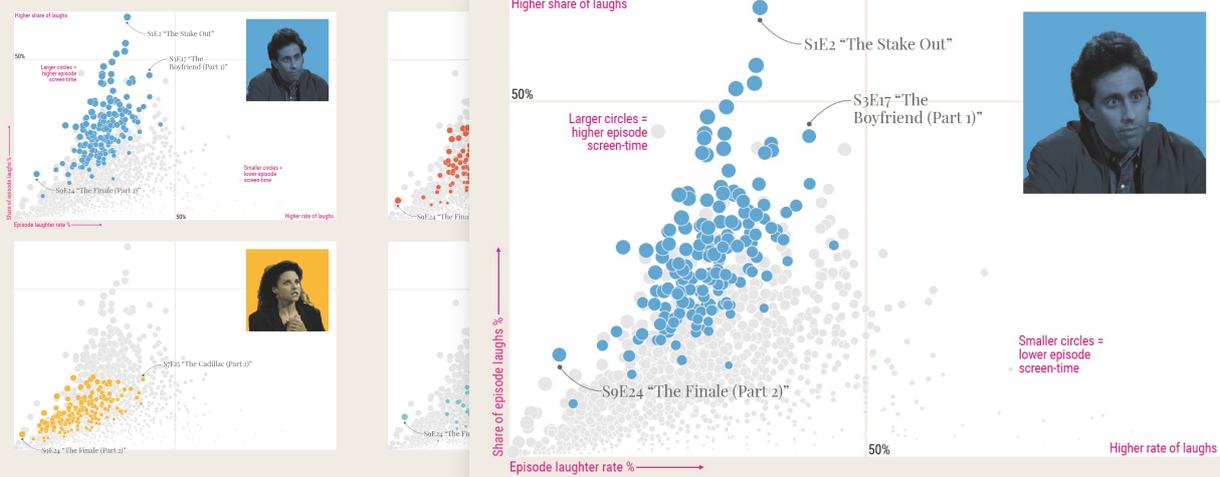
North Carolina

State	New Cases	Tests per 1,000 people	Percent Positive
	New daily cases	Daily Tests	Daily % positive
North Carolina	+3,358 new	1.0 tests per 1,000	7.9% positive
	+3,235 new	1.6 tests per 1,000	4.4% positive
	+2,783 new	1.3 tests per 1,000	7.0% positive
	+2,341 new	1.2 tests per 1,000	17.7% positive
	+793 new	1.6 tests per 1,000	7.5% positive

Graphicacy <https://coronavirus.jhu.edu/testing/tracker/overview>

Reducing obstacles to understanding

Which episodes demonstrate peak (and low) performances for the lead characters?

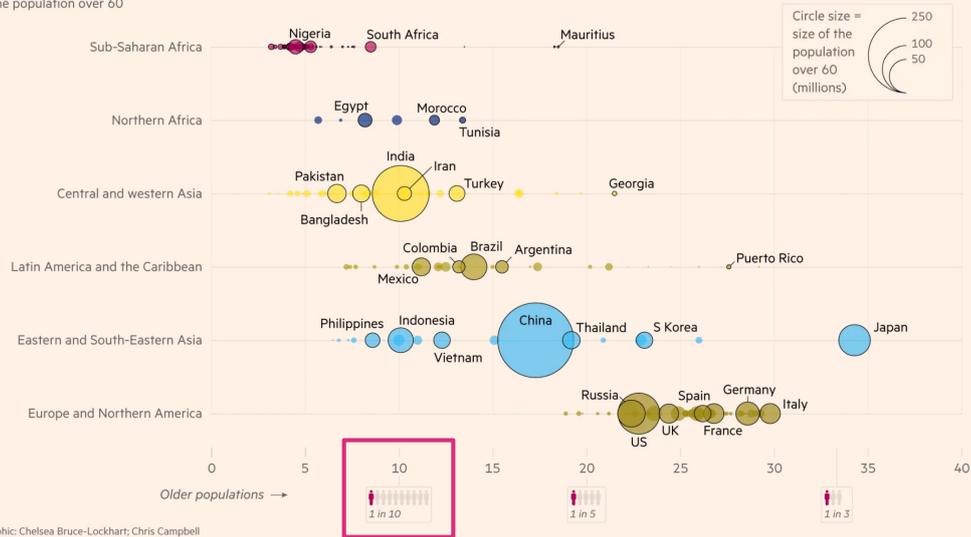


Andy Kirk <https://www.visualisingdata.com/2020/09/new-project-the-seinfeld-chronicles/>

Reducing obstacles to understanding

Relatively few people in Africa are over 60

% of the population over 60



FT graphic: Chelsea Bruce-Lockhart; Chris Campbell
Source: UN
© FT

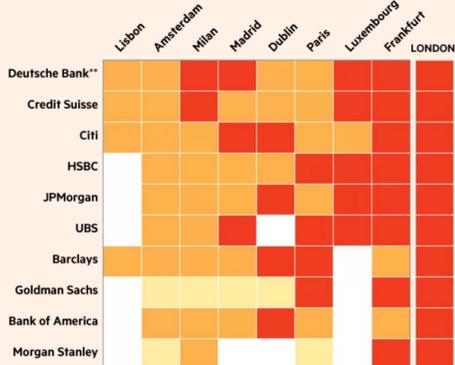
Chelsea Bruce-Lockhart <https://www.ft.com/content/lb3274ce-de3b-411d-8544-a024e64c3542>

Reducing obstacles to understanding

The Brexit banking matrix: The contenders lining up for London's crown

Bank The highest level of presence in each city
Branch Other*

Darker columns indicate strong presence in a city
Darker rows indicate broad presence of a bank



Darker columns indicate strong presence in a city
Darker rows indicate broad presence of a bank

* Broker dealer branches are included for Morgan Stanley and Goldman Sachs as they are a significant part of their European network.
** Deutsche Bank has a London subsidiary but its main entity is a branch

FT graphic Alan Smith, Laura Noonan Source: FT research

FT

Alan Smith <https://www.ft.com/content/3f3ce35e-8c9b-11e6-8a35-f79f5696c731>

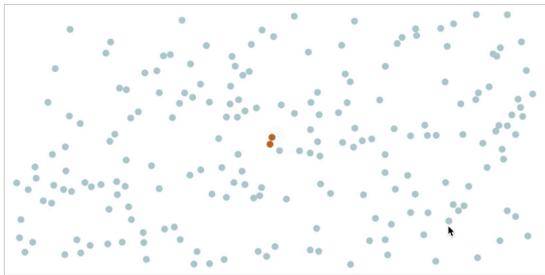
Don't underestimate the capabilities of people to grasp unfamiliar charts and/or topics...

Let's see what happens when similitis spreads in a town of 200 people. We will start everyone in town at a random position, moving at a random angle, and we will make one person **sick**.

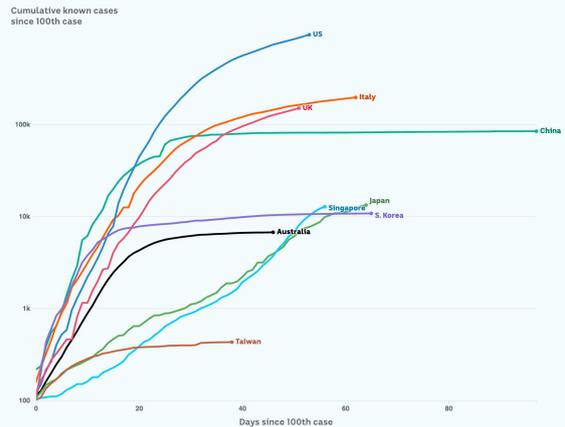
Notice how the slope of the red curve, which represents the number of sick people, rises rapidly as the disease spreads and then tapers off as people recover.

Count
 Recovered 0
 Healthy 198
 Sick 2

Change over time

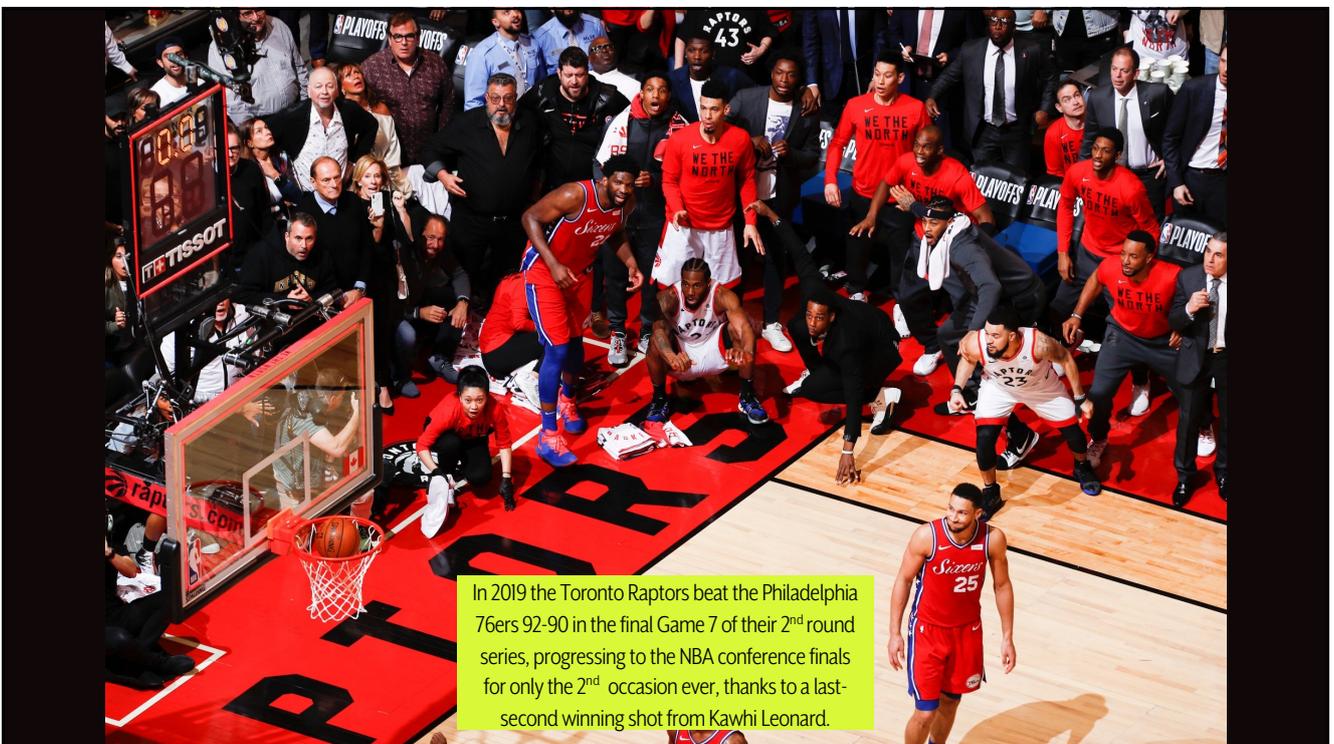


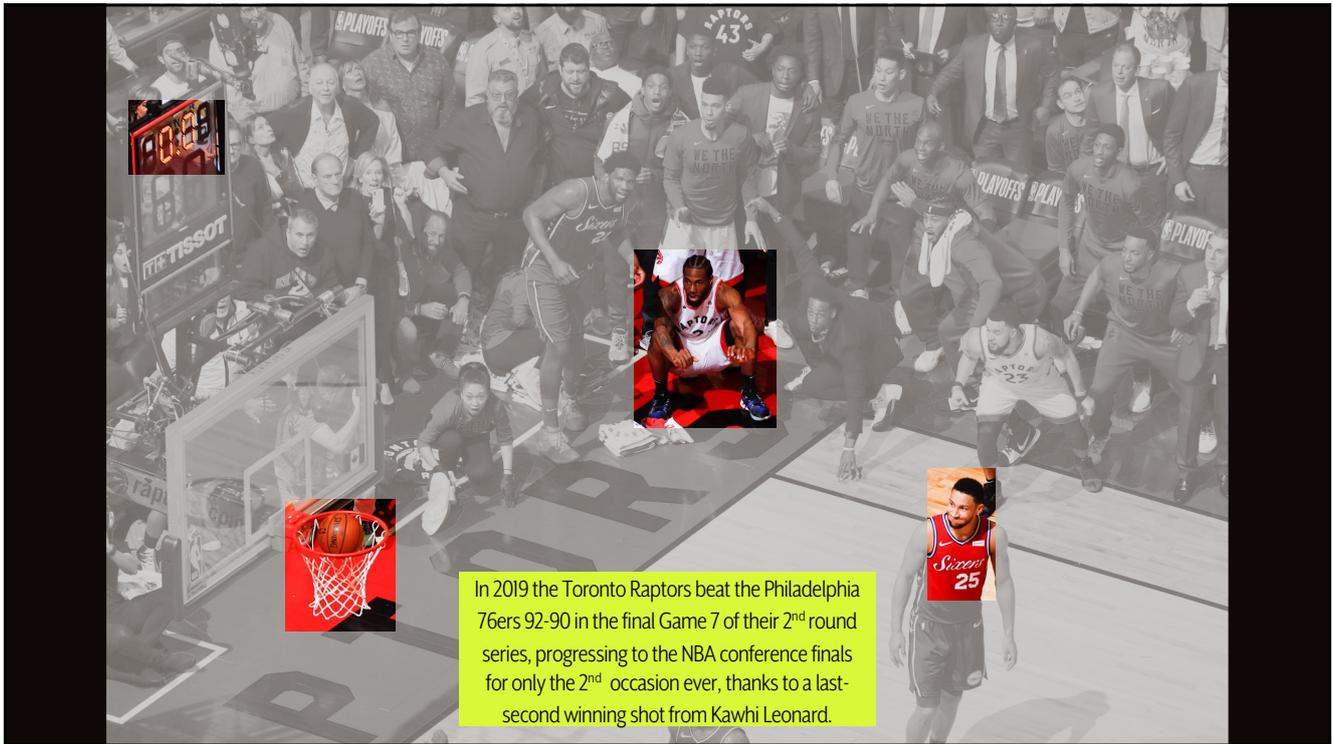
It's a little hard to wrap your head around, unless you're a maths whiz. But here's another way to think about it. If a country's cases are growing exponentially, it'll appear on this chart as a straight line headed up and to the right.



Harry Stevens (Washington Post) <https://www.washingtonpost.com/graphics/2020/world/coronavirus-simulator/>
 ABC <https://www.abc.net.au/news/2020-03-26/coronavirus-covid19-global-spread-data-explained/12088028?nw=0&pfmredir=sm>

WHO WILL DO THE WORK?
Offering the right experience





You show and tell

You show

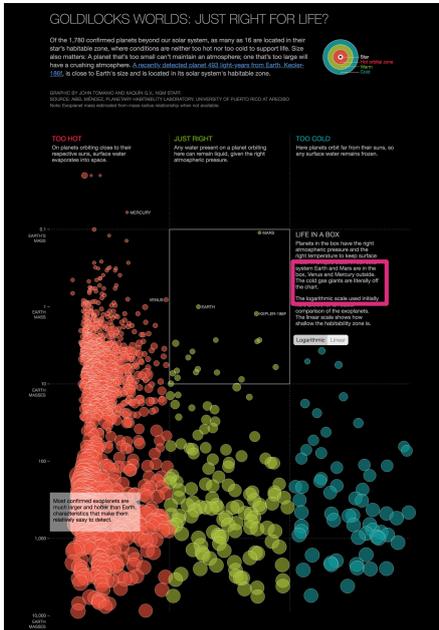
They explore

Explanatory

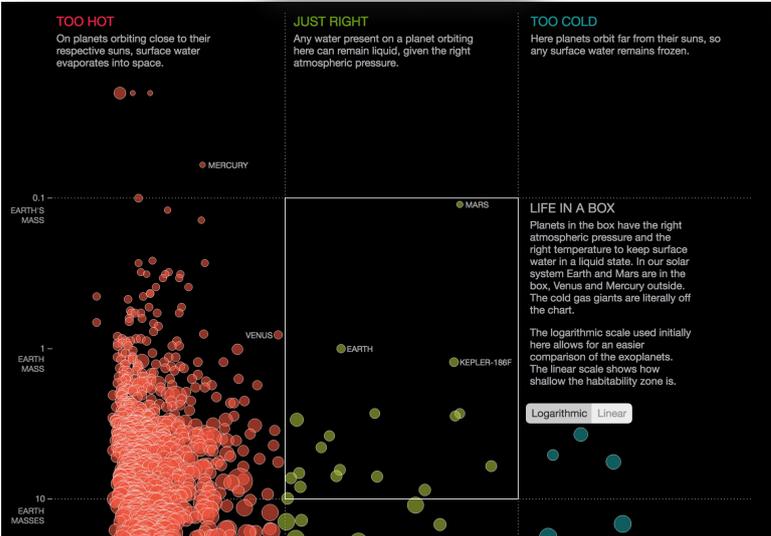
Exhibitory

Exploratory

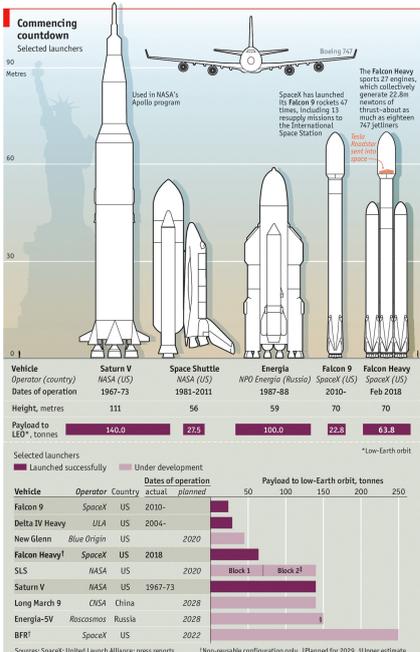




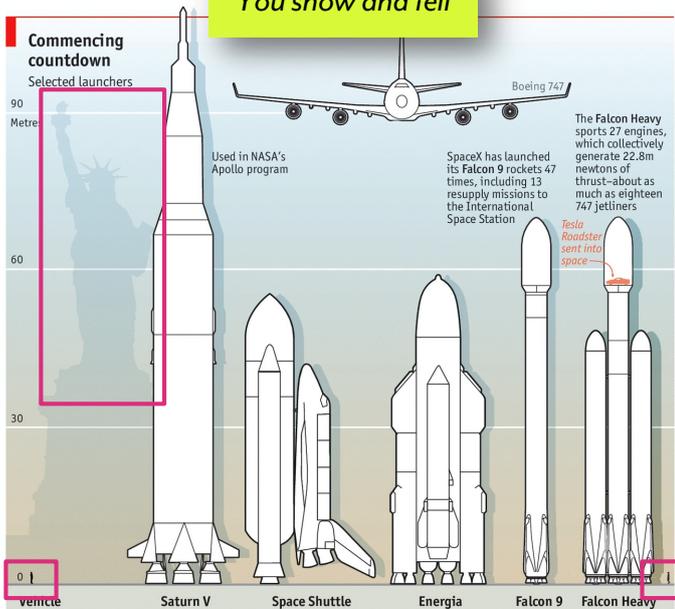
You show and tell



National Geographic <http://www.nationalgeographic.com/astrobiology/goldilocks-worlds/>



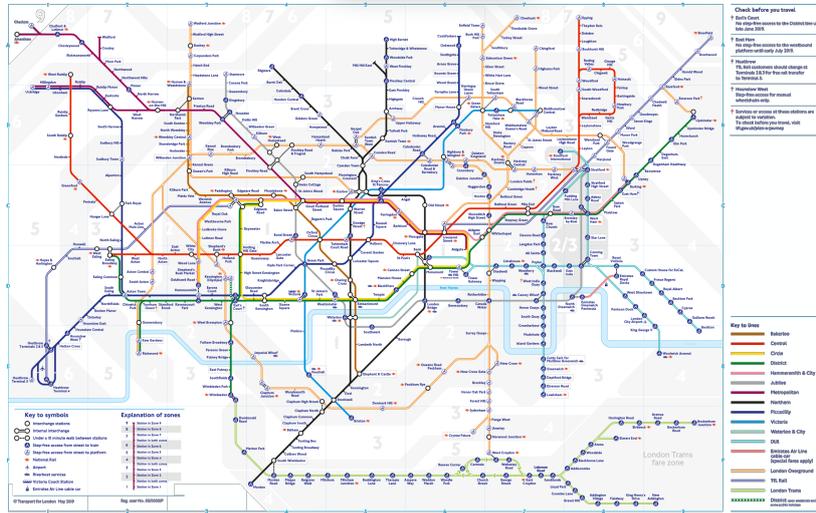
You show and tell



The Economist <https://www.economist.com/science-and-technology/2018/07/05/the-falcon-heavy-successful-flight-is-another-vindication-for-elon-musk>

You show

Tube map



MAYOR OF LONDON

tfl.gov.uk

24 hour travel information
0345 222 1234*

Sign up for email updates
tfl.gov.uk/emailupdates

@TFLTravelAlerts



TRANSPORT FOR LONDON
EVERY JOURNEY MATTERS

Online maps are strictly for personal use only. To license the Tube map for commercial use please visit tfl.gov.uk/mpl/branding

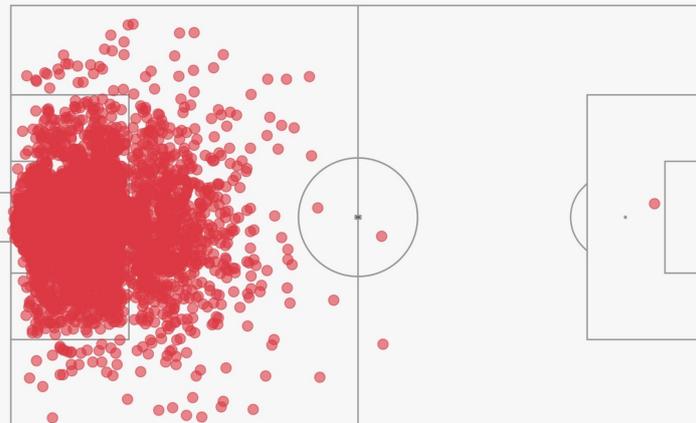
Transport for London <https://tfl.gov.uk/maps/tracktube>

You show

Alisson

Liverpool Career (All Comps)

The Analyst



Attacking Direction →

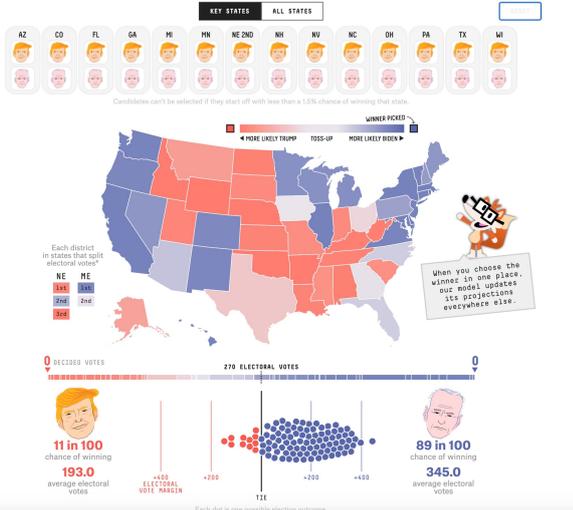
The Analyst <https://theanalyst.com/eu/2021/05/the-analyst-may16/>

Explore The Ways Trump Or Biden Could Win The Election

They explore

Pick the winner of each state to see how FiveThirtyEight's presidential forecast would change.

2020 election forecast How our forecast works
By Ryan Beitz, Jay Bybee, Aaron Bycoffe and Nate Silver



Your map

The map shows places where answers most closely match your own, based on more than 5,300 respondents who said they were from Ireland or Britain.

Thank you! We have where you were related as:

Devonshire, England GB

Want to keep going?

We have dozens more questions. Click the button below to continue answering, or keep reading to explore which words define your dialect best.

More, please!



Question 1 of 25 Which of these words (if any) would you use for someone you think is stupid?

Choose all that apply.

gowl	berk
dose	numpty
dummy	melt
charlie	wazzock
moron	dope
pillock	idiot
plank	eejit

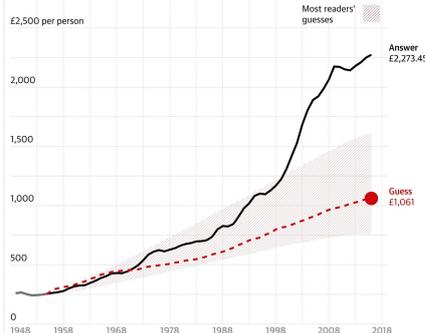
Or submit your own

FiveThirtyEight <https://projects.fivethirtyeight.com/trump-biden-election-map/> TheUpshot <https://www.nytimes.com/interactive/2019/02/15/upshot/british-irish-dialect-quiz.html>

They participate



How has NHS spending per person changed? After adjusting for inflation, the NHS spent £260 per person in 1949



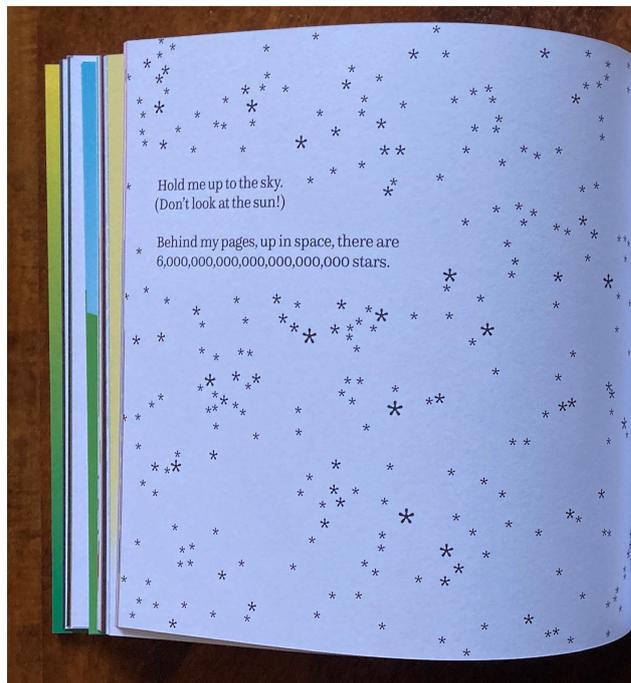
The NHS now spends almost **9 times more per person** than it did in 1949

Given how often a lack of NHS funding appears on the news agenda you'd be forgiven for concluding that the government's health spend had fallen over time. However, with few exceptions, health spending has risen year-on-year since the foundation of the NHS seven decades ago. The last time this trend was bucked was in 2010/11 when funding per head stagnated following the global downturn.

The Guardian <https://www.theguardian.com/society/ng-interactive/2018/jul/02/nhs-at-70-how-well-do-you-know-the-health-service>

I am
a book.
I am
a portal
to the
universe.

They participate



<https://www.iamabook.online/>

HOW TO CONVEY UNDERSTANDING?

Finding the right tone of voice

0 10 20 30 40 50 60 70 80 90 100

Reading

Feeling

Analytical efficiency
 Precision and detail
 Abstracted treatment
 Suppress subject emotion

Conceptual efficiency
 Gist and patterns
 Figurative treatment
 Amplify subject emotion

Graphical Perception: Theory, Experimentation, and Application to the Development of Graphical Methods



William S. Cleveland, Robert McGill

Journal of the American Statistical Association, Vol. 79, No. 387 (Sep., 1984), 531-554.

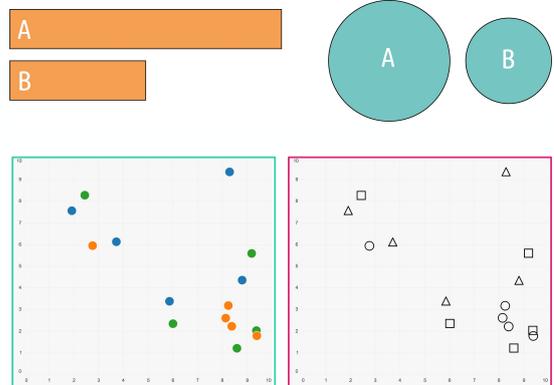
Stable URL:
<http://links.jstor.org/sici/sici=0162-1439/92/1984095/2979%3A5387%3C51%3AAGPTA%3E2.0.CO;382-Y>

Journal of the American Statistical Association is currently published by American Statistical Association.

“The ordering does not result in a precise prescription for displaying data but rather is a framework within which to work.”

William Cleveland & Robert McGill

Qualitative Nominal	Qualitative Ordinal	Quantitative Interval, Ratio
Position	Position	Position
Colour (Hue)	Pattern (Density)	Size (Length)
Pattern (Texture)	Colour (Lightness)	Angle
Connection	Colour (Hue)	Size (Area)
Containment	Pattern (Texture)	Size (Volume)
Pattern (Density)	Connection	Pattern (Density)
Colour (Lightness)	Containment	Colour (Lightness)
Symbol	Size (Length)	Colour (Hue)
Size (Length)	Angle	Pattern (Texture)
Angle	Size (Area)	Connection
Size (Area)	Size (Volume)	Containment
Size (Volume)	Symbol	Symbol

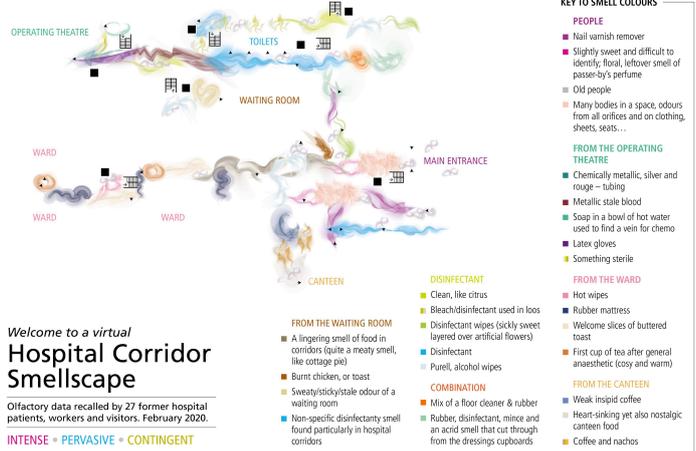
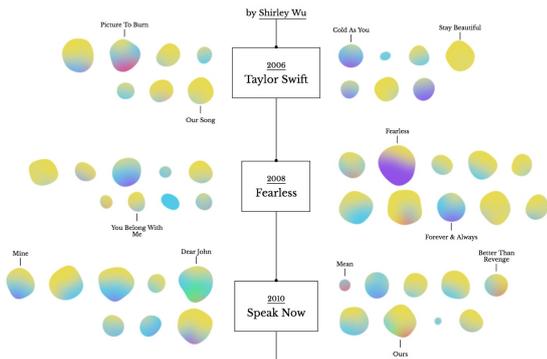


From <http://euclid.psych.yorku.ca/www/bsv6135/papers/ClevelandMcGill1984.pdf>

Gist and patterns

Taylor Swift is mostly **happy**, quite often **sad**, sometimes **mad**, and occasionally **really scared**.*

*according to IBM Watson



Welcome to a virtual Hospital Corridor Smellscape

Olfactory data recalled by 27 former hospital patients, workers and visitors. February 2020.

Shirley Wu (As yet unpublished) | Kate McLean <https://twitter.com/katemclean/status/126642817378286083>

Relatable in feeling

An Incalculable Loss

America has reached a grim milestone in the coronavirus outbreak — each figure here represents one of the 100,000 lives lost so far. But a count reveals only so much. Memories, gathered from obituaries across the country, help us to reckon with what was lost.

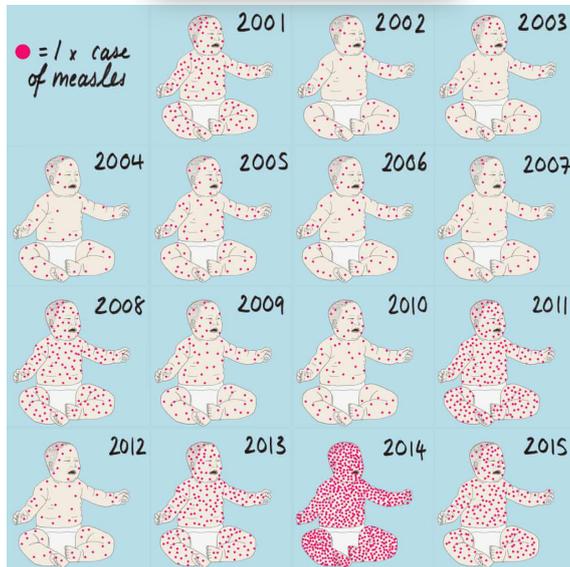
BY THE NEW YORK TIMES UPDATED MAY 27, 2020

Auditor in Silicon Valley.
Patricia Dowd, 57, San Jose, Calif.

Great-grandmother with an easy laugh.
Marion Krueger, 85, Kirkland, Wash.

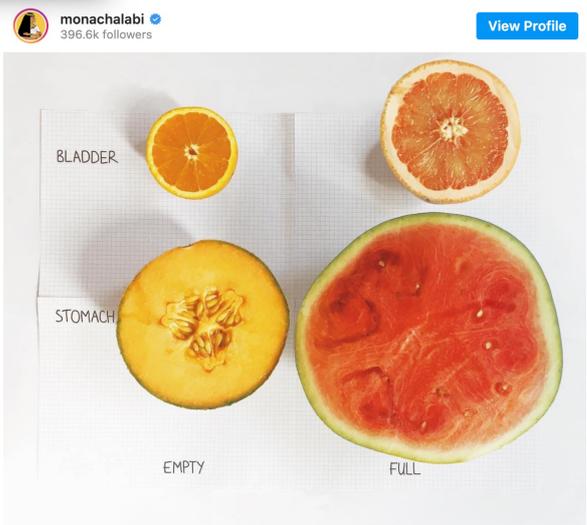
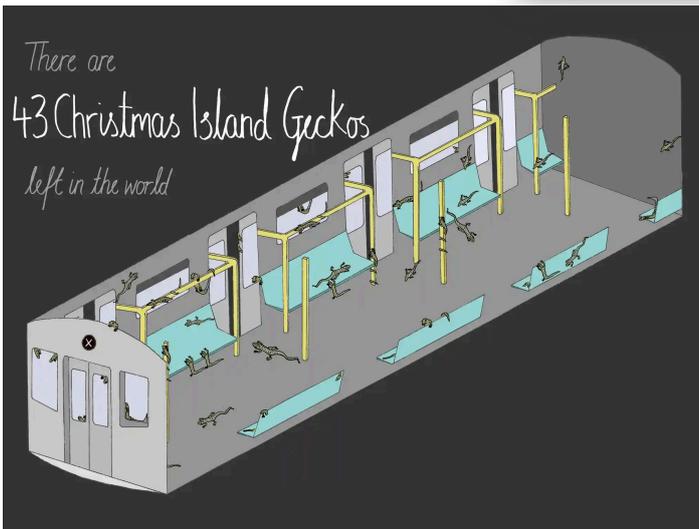
Visualisation by the New York Times <https://www.nytimes.com/interactive/2020/05/27/sunday-review/coronavirus-effects.html>

Relatable in feeling

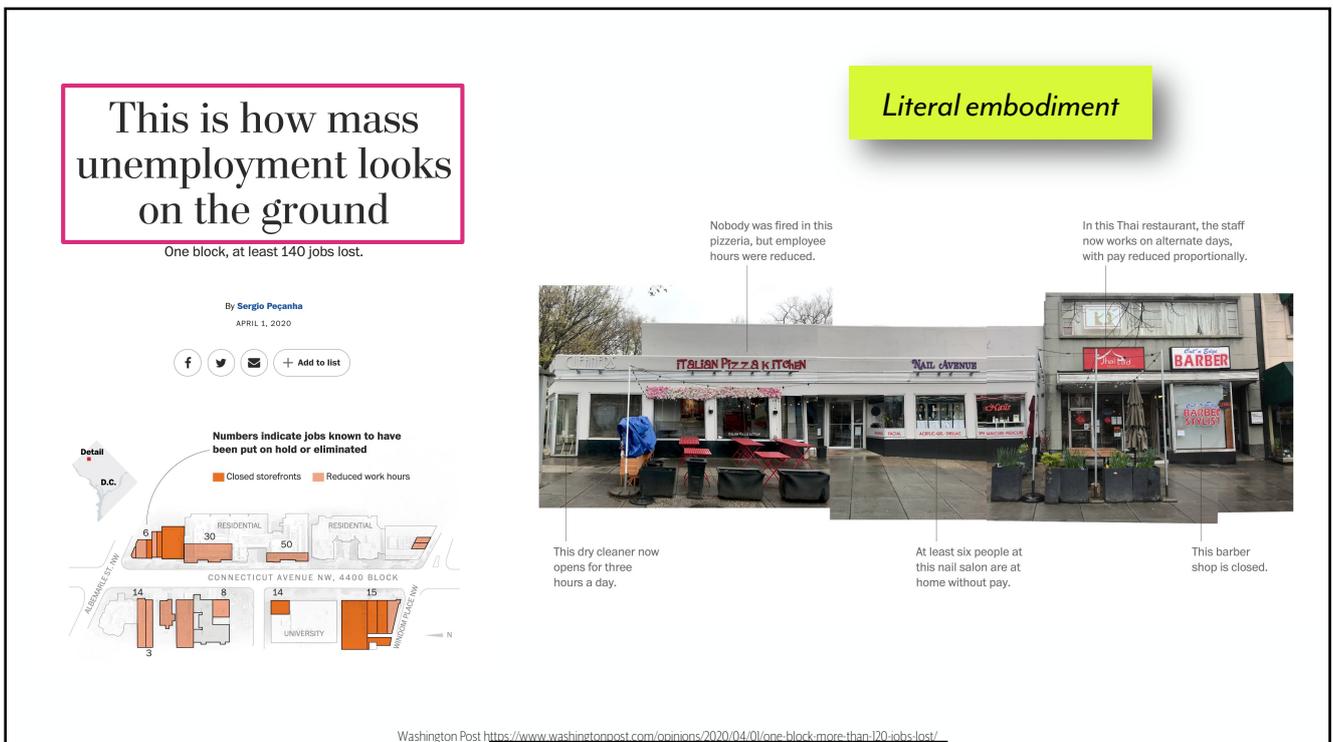
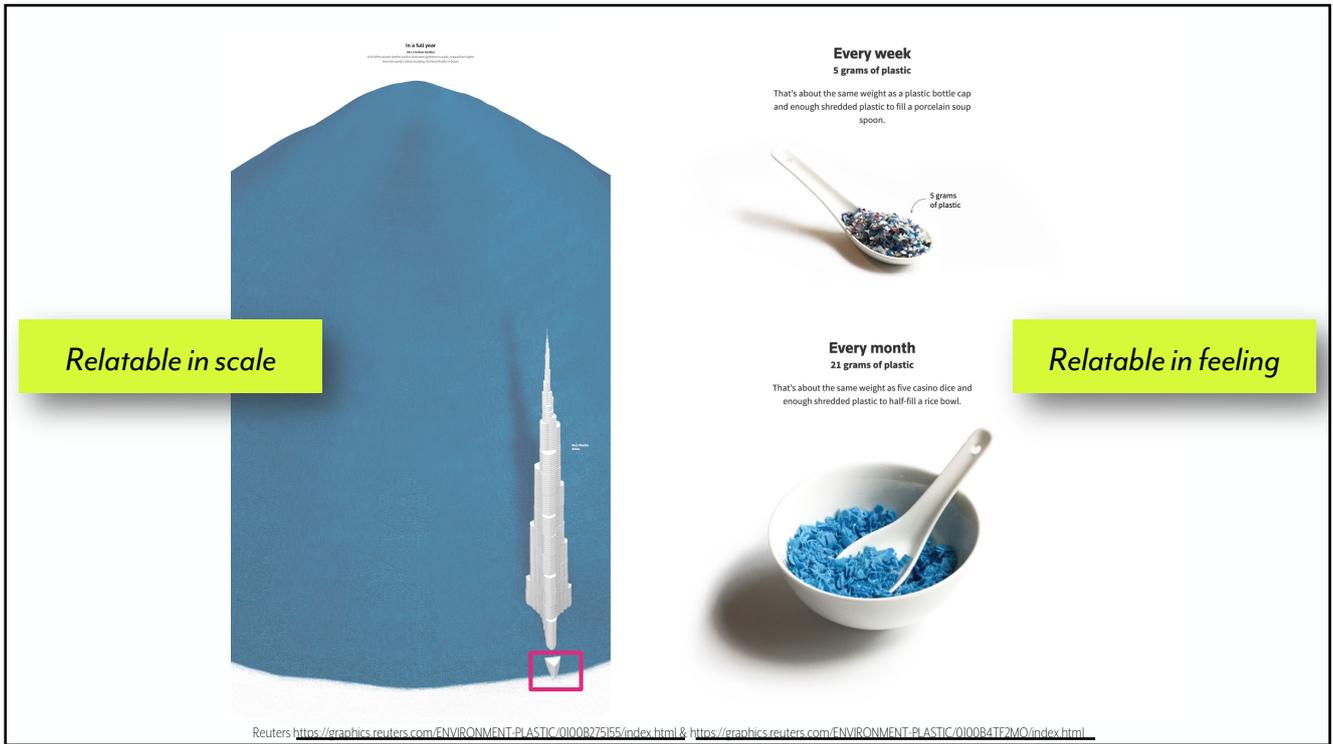


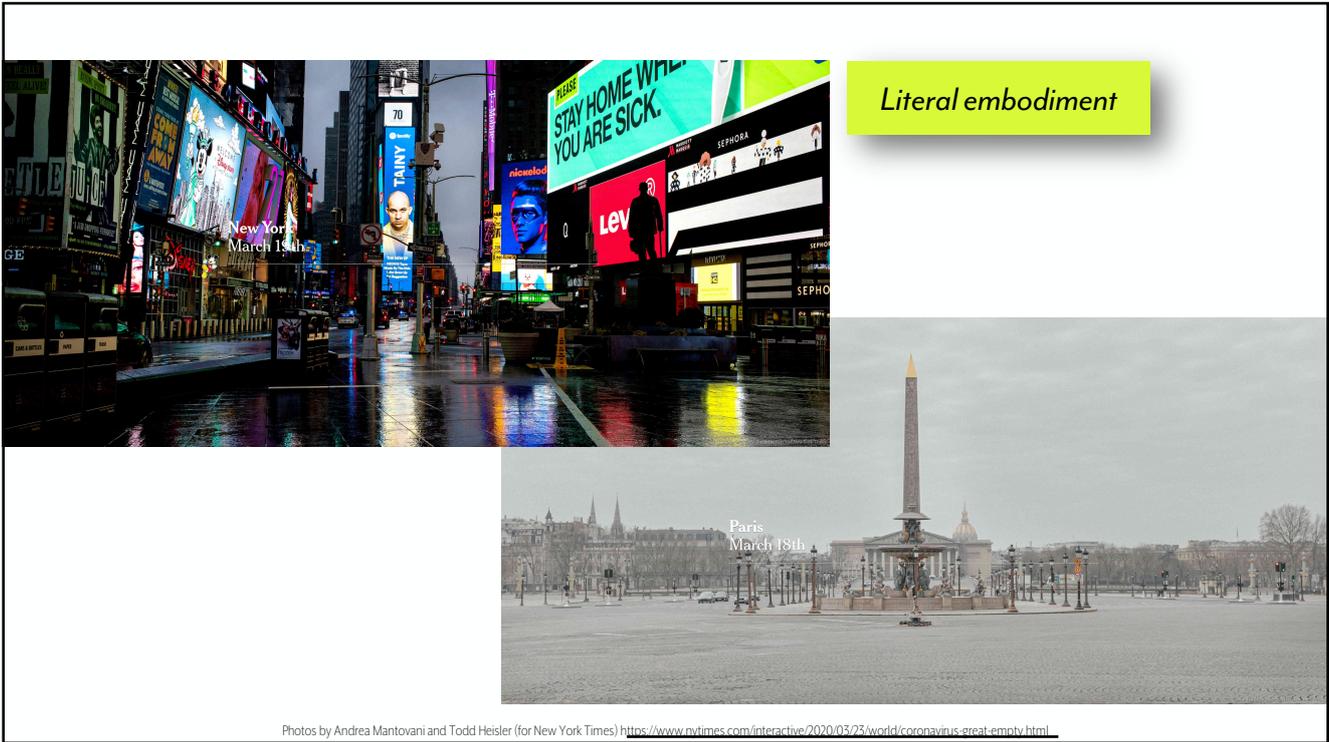
Mona Chalabi <https://www.theguardian.com/news/datablog/2019/jan/31/measles-outbreaks-us-anti-vaccine-movement>

Relatable in scale



Mona Chalabi <https://www.theguardian.com/environment/gallery/2018/sep/17/endangered-species-on-a-train> and <https://www.instagram.com/p/BV4-kWxFrX>





Designing for your audience

WHO ARE THEY?

HOW WILL THEY ENCOUNTER IT?

WHAT UNDERSTANDING ARE YOU FACILITATING?

WHAT ARE THEIR CAPABILITIES?

WHO WILL DO THE WORK?

HOW TO CONVEY UNDERSTANDING?

It is hard to design for others. It is harder if you don't even care to try.