

**Benjamin Bach**  
June 2022  
<http://benjbach.me>  
<https://datavis-online.github.io>

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# Outline

How to tell stories with data?

- Exploration vs. Explanation
- Storytelling
- Storytelling structures
- Storytelling patterns
- Storytelling Genres
- Style and design

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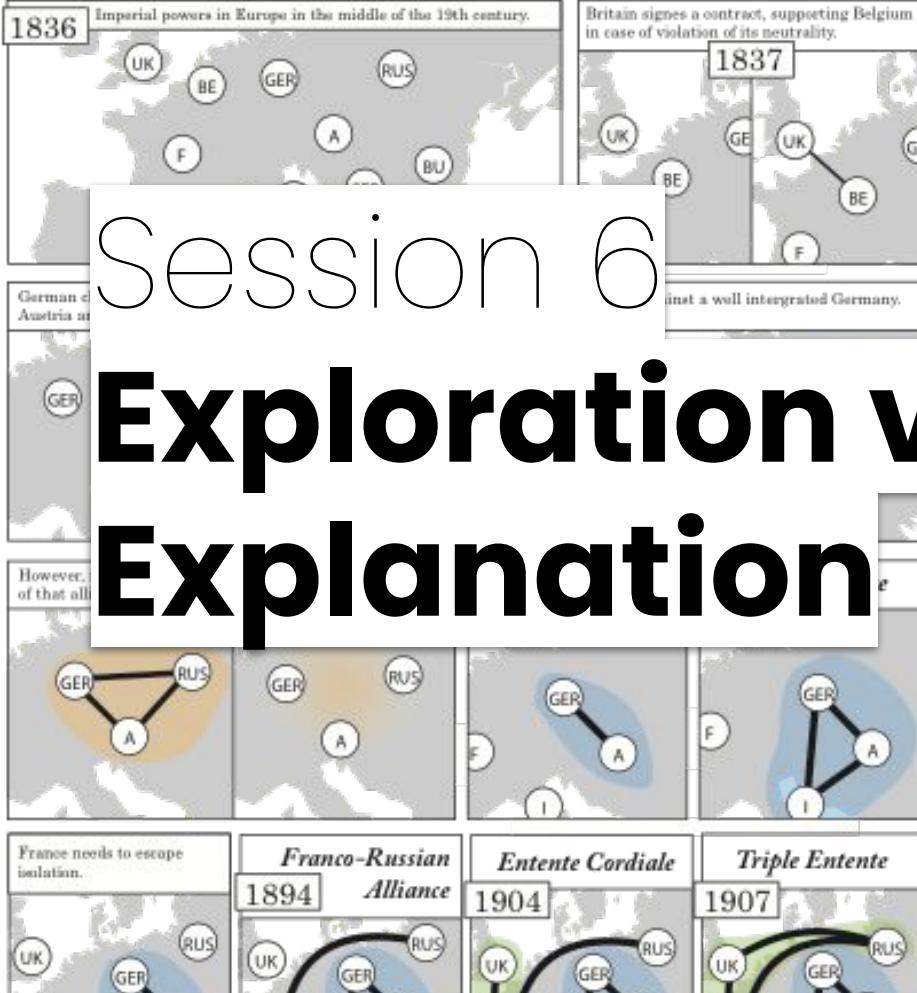
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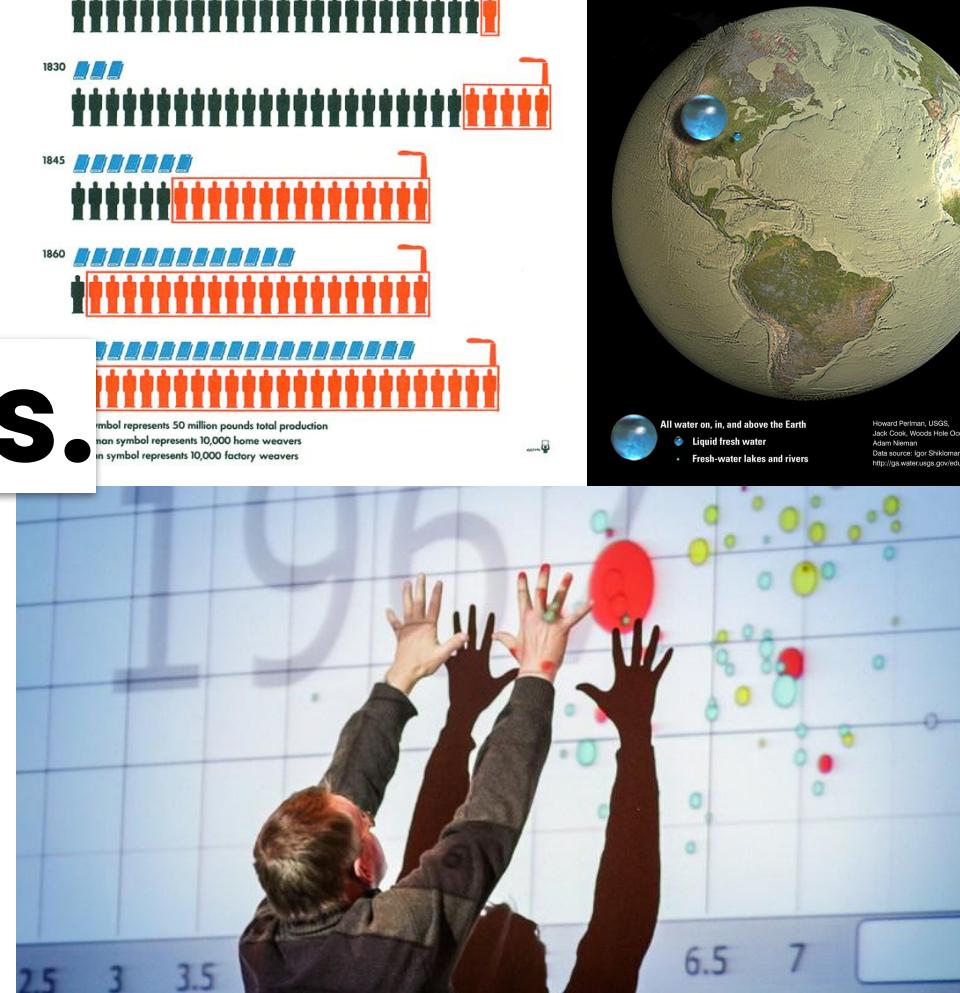
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# Session 6

# Exploration vs. Explanation



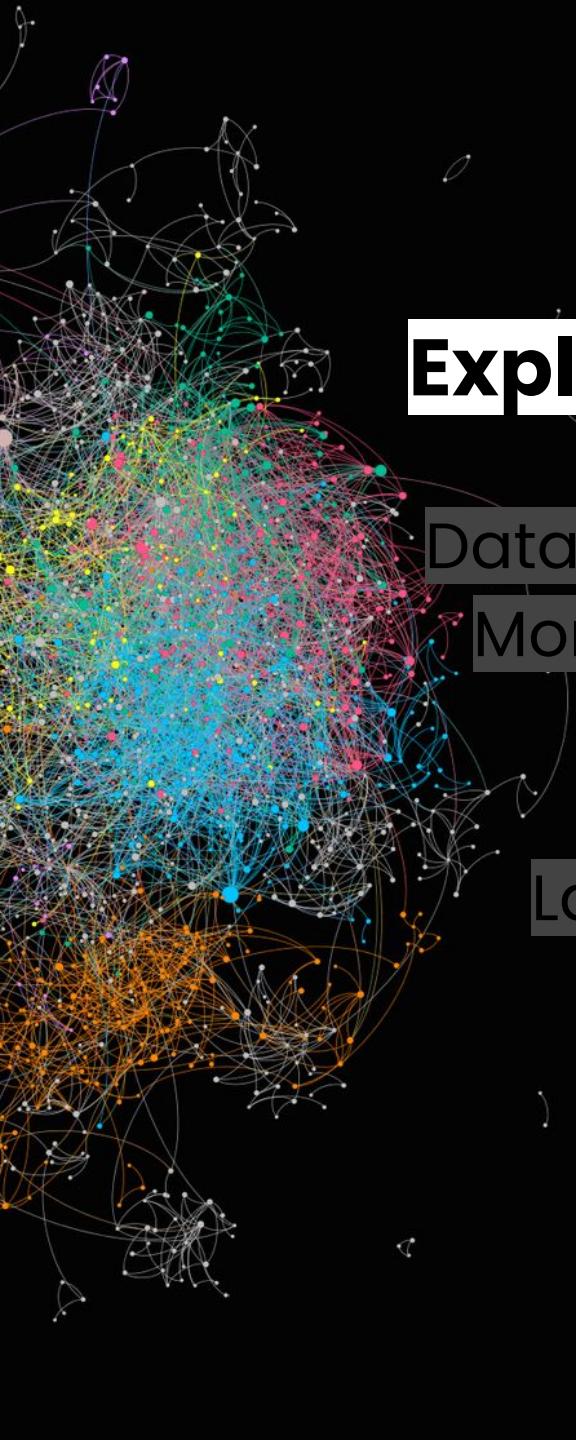
Online Course  
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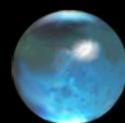
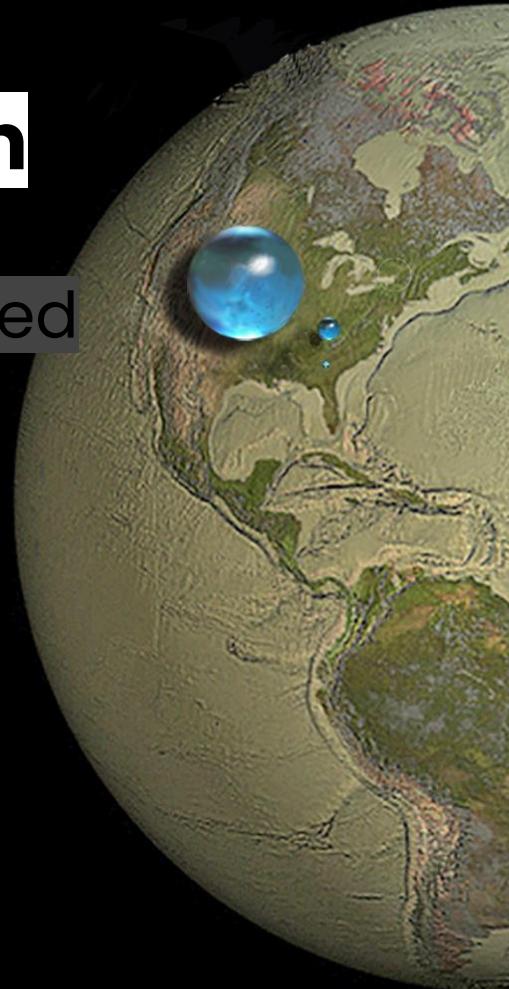
# The World's Water

## Exploration

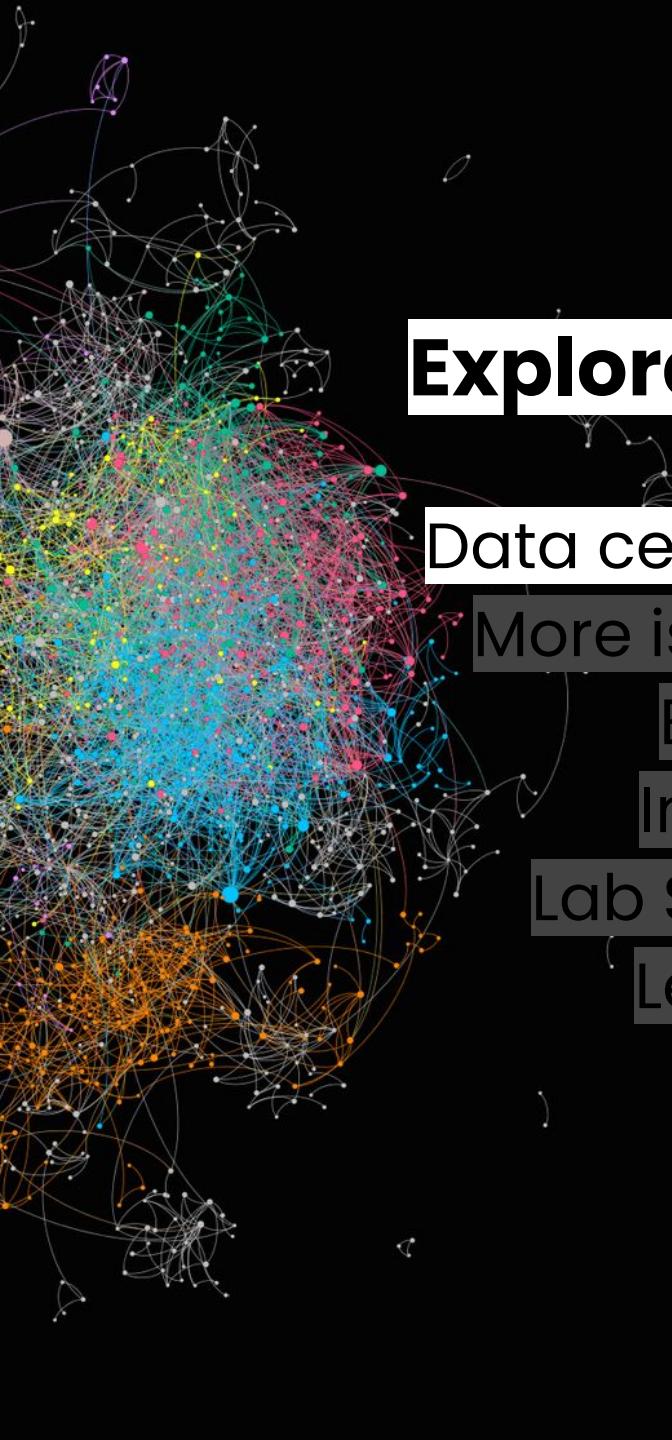
Data centered  
More is more  
Experts  
Insights  
Lab Setting  
Lengthy  
Fuzzy

## Explanation

Human centered  
Less is more  
Non-experts  
Messages  
In-the-wild  
To-the-point  
Precise



- All water on, in, and above the Earth
- Liquid fresh water
- Fresh-water lakes and rivers



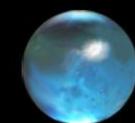
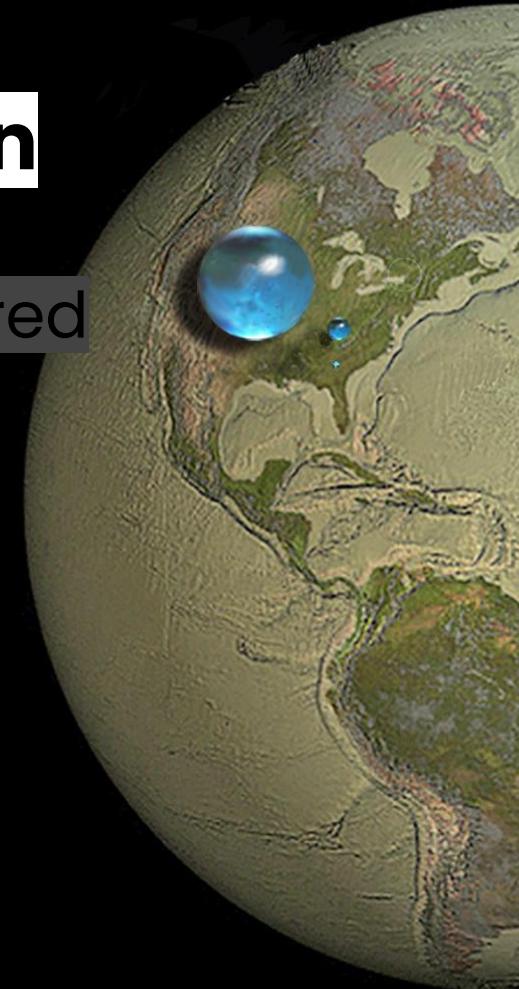
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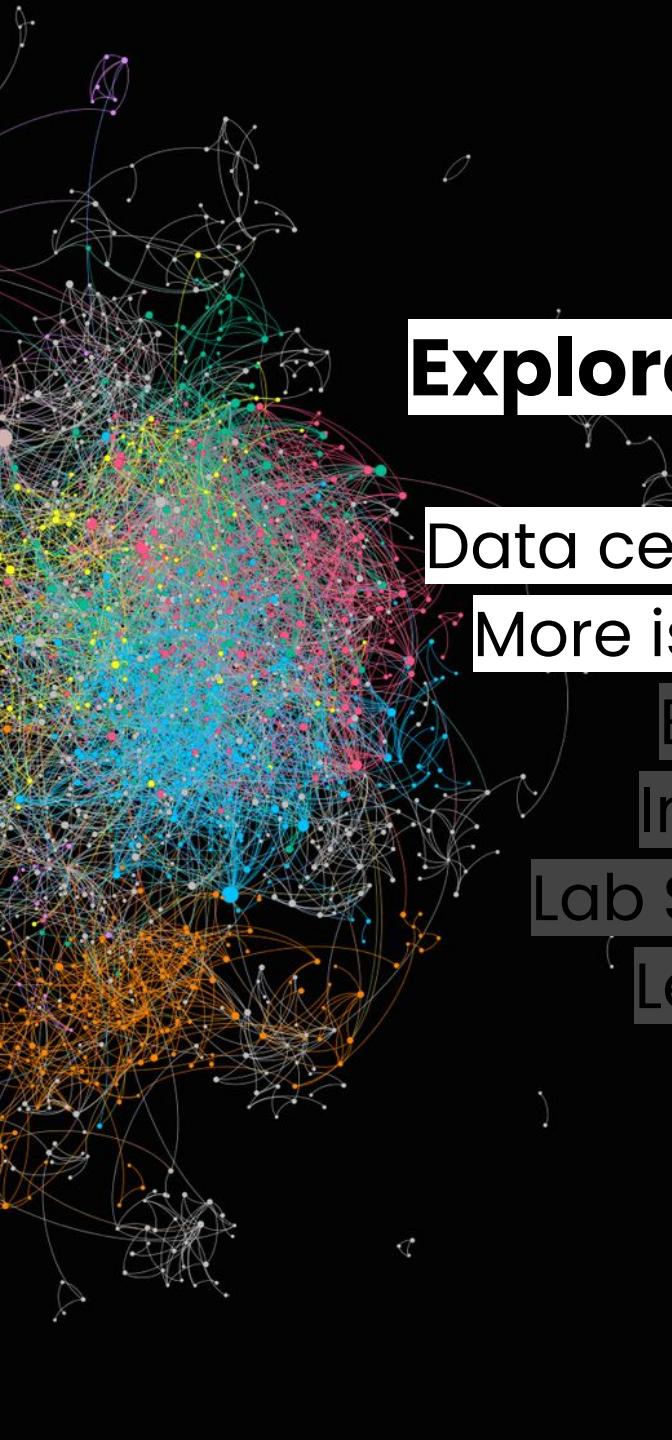
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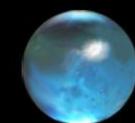
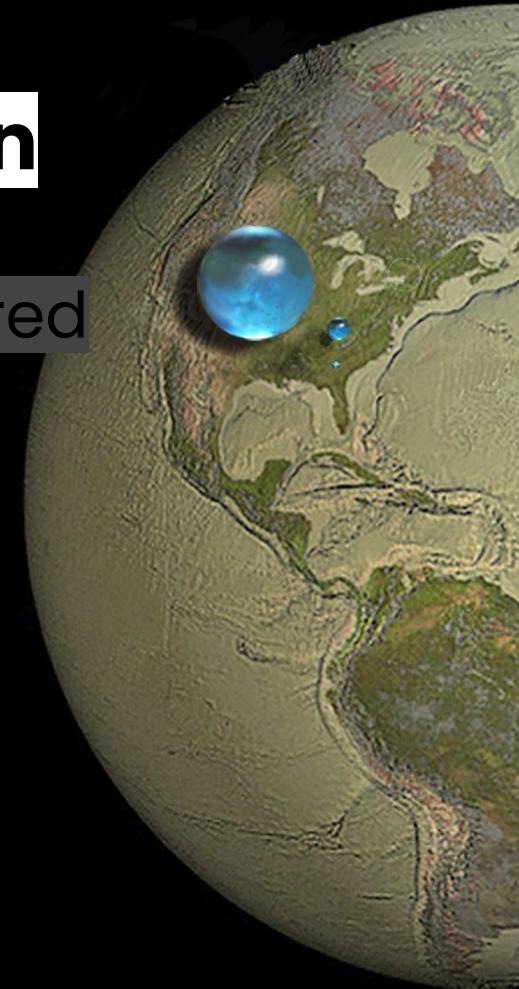
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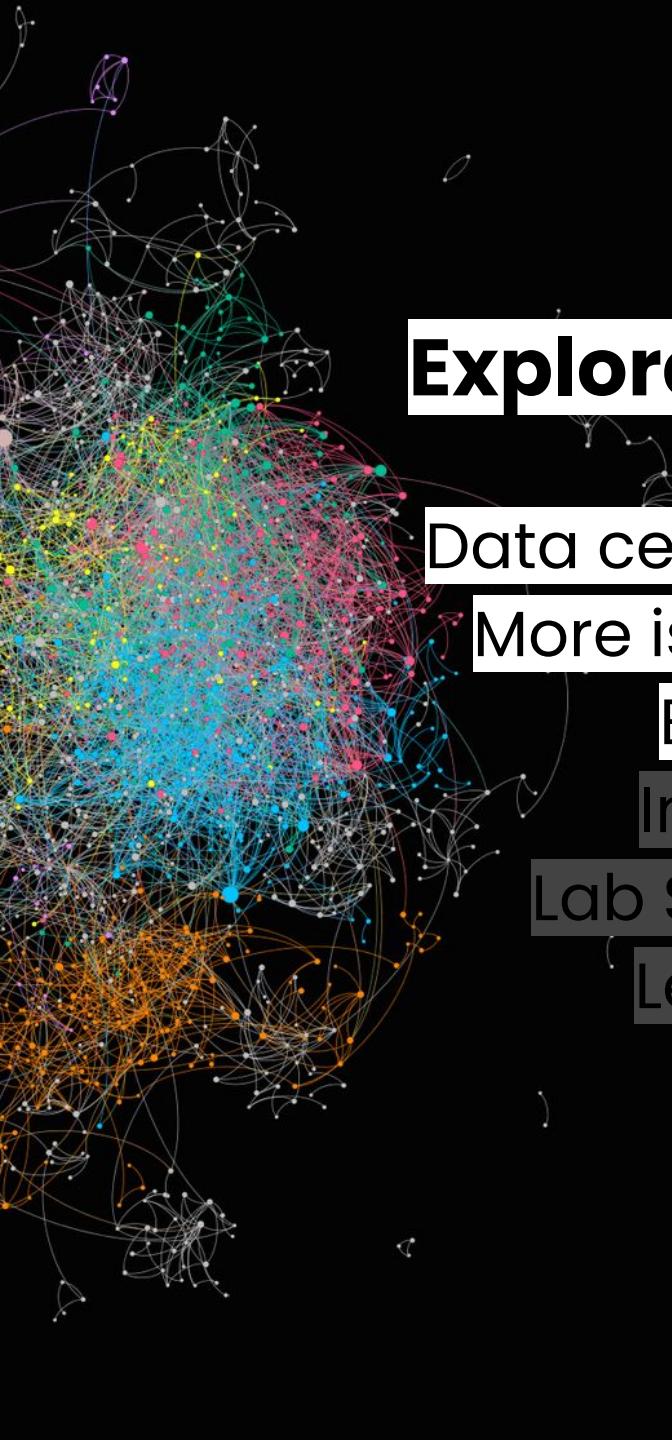
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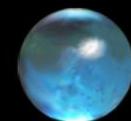
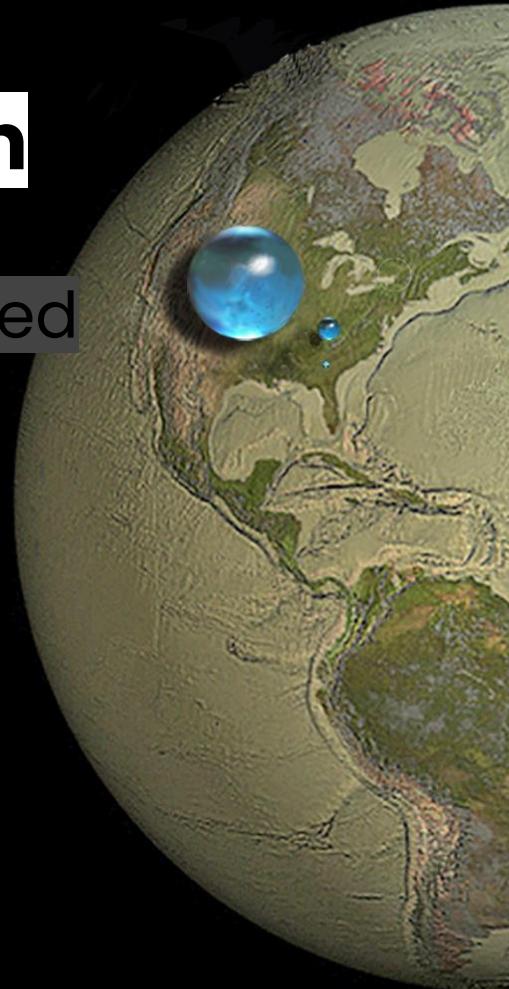
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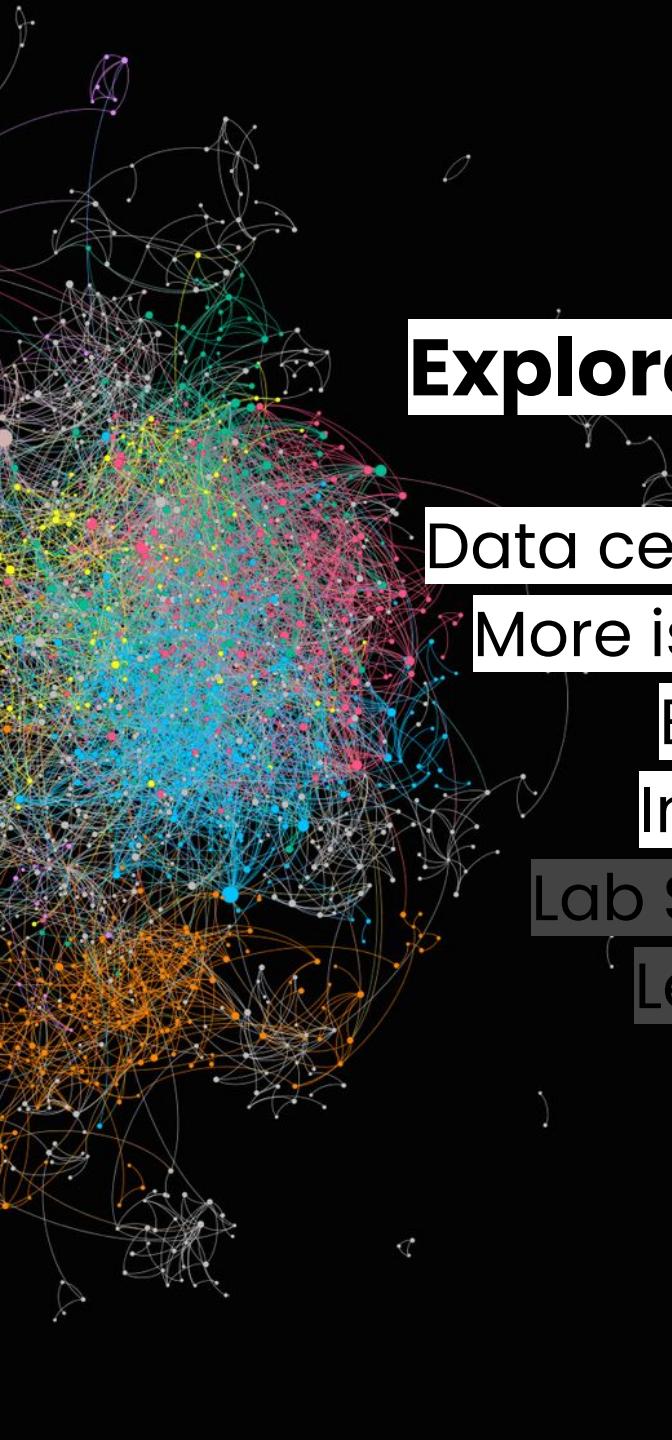
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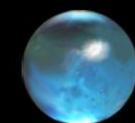
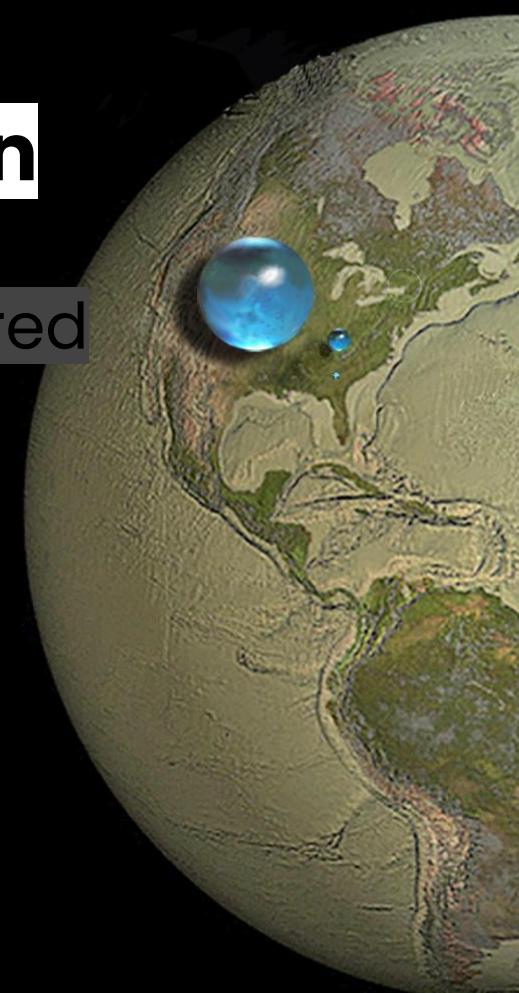
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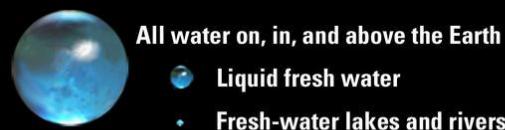
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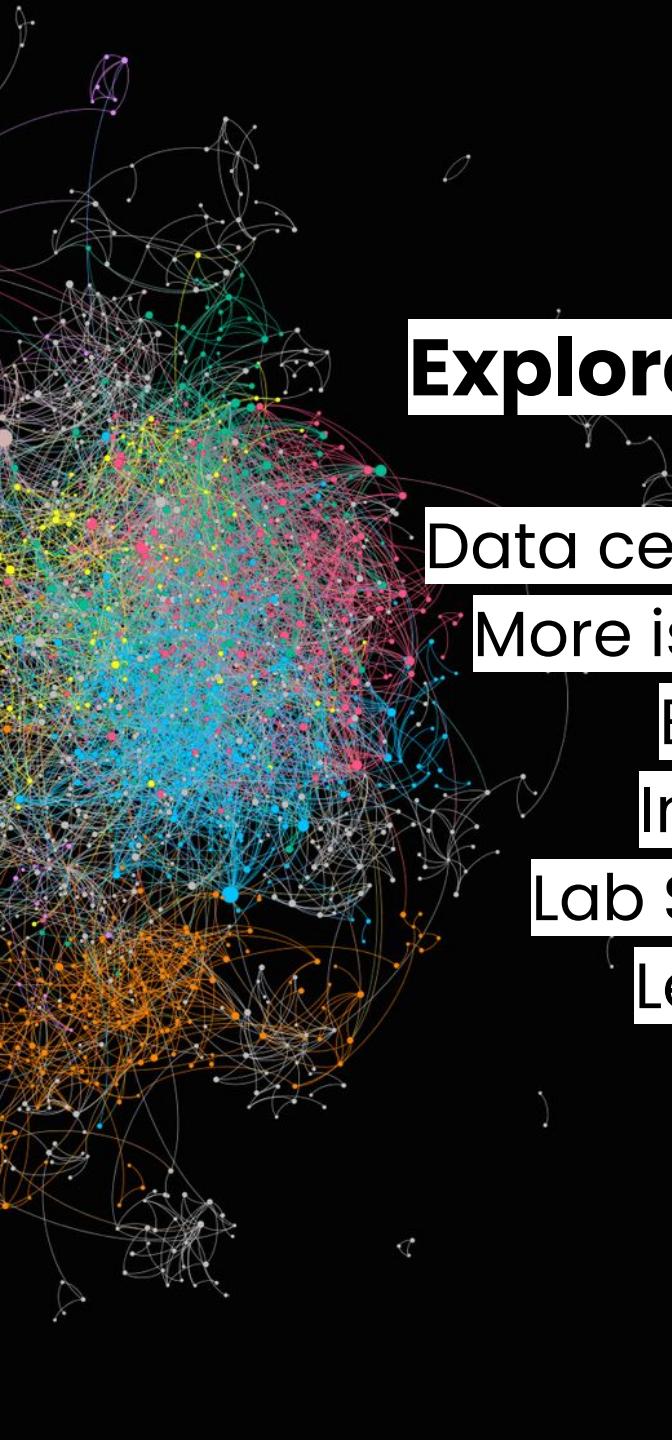
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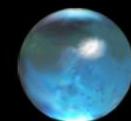
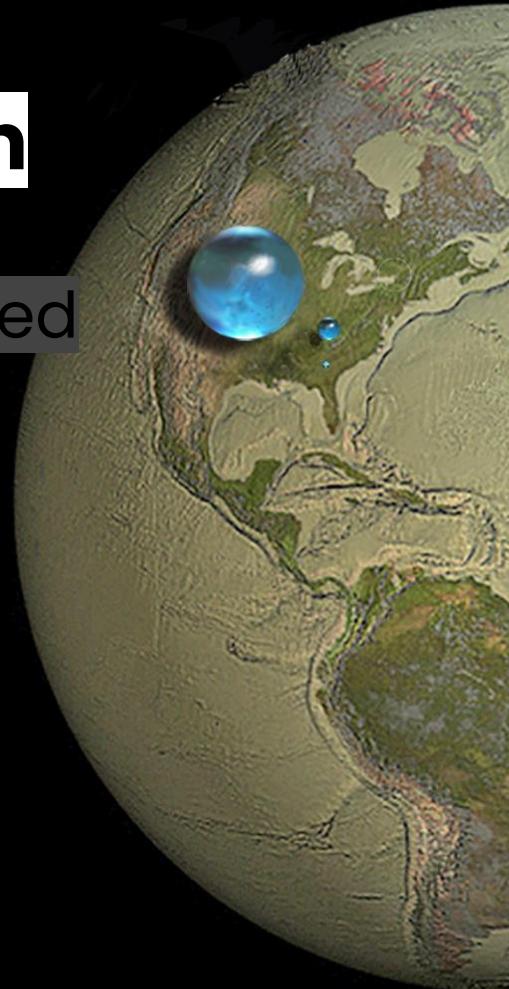
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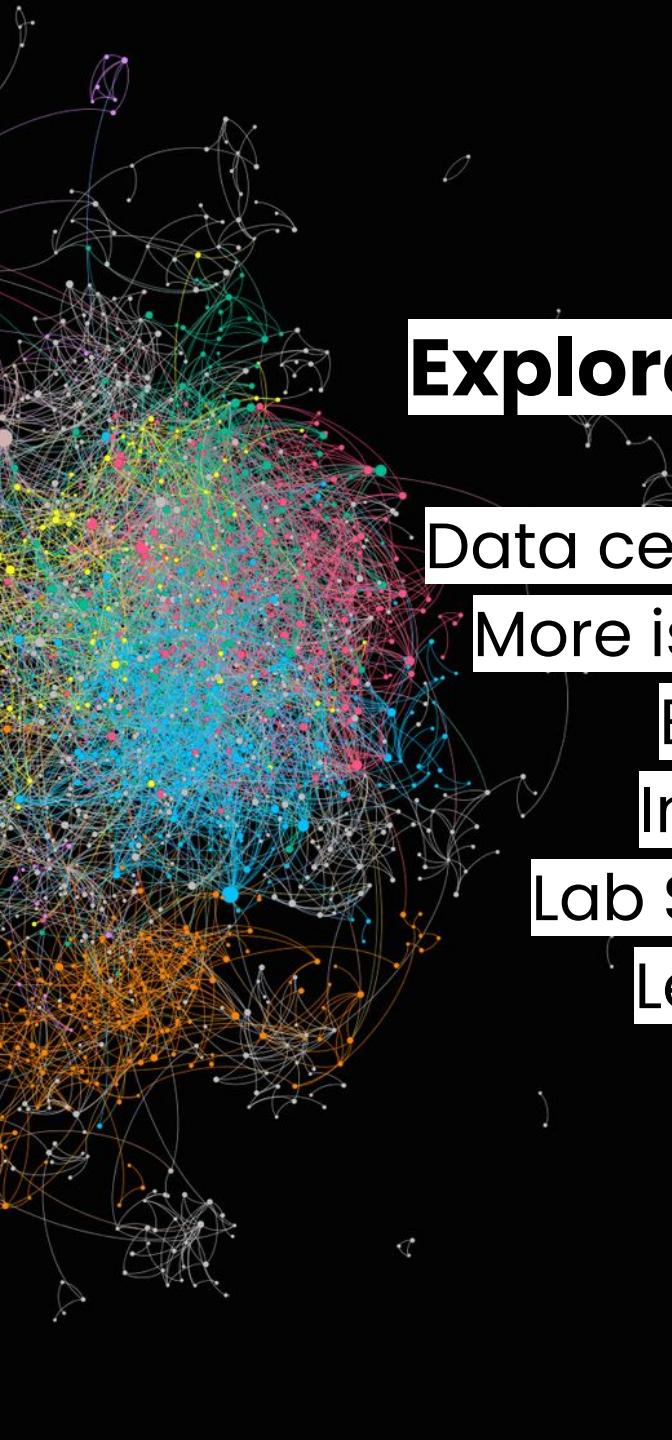
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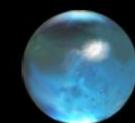
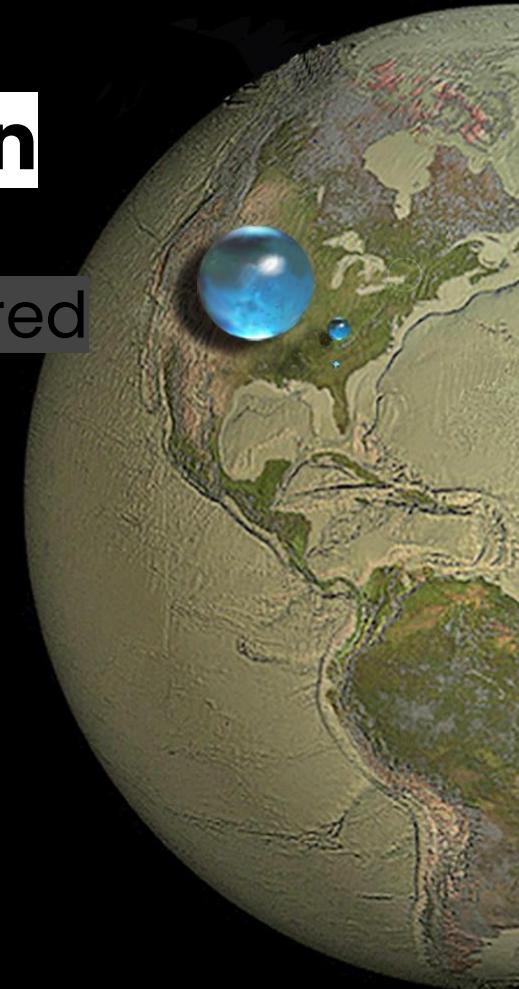
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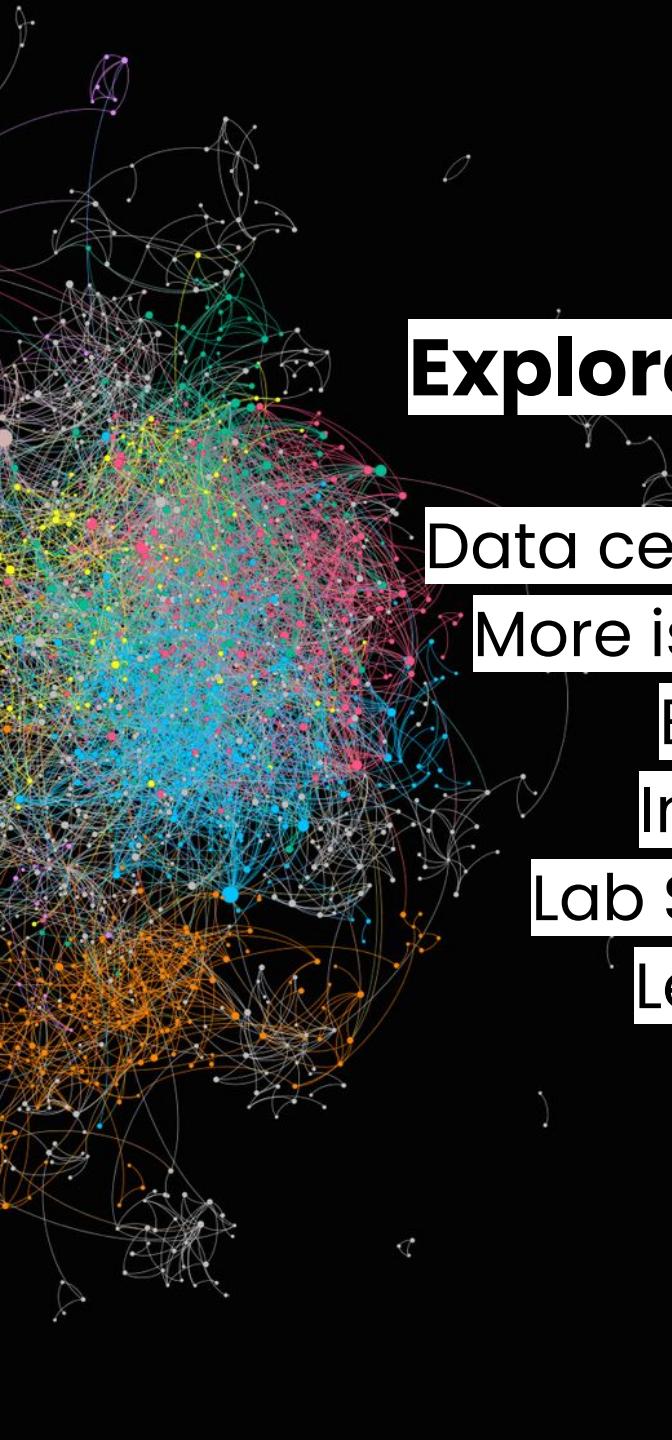
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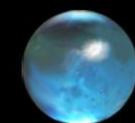
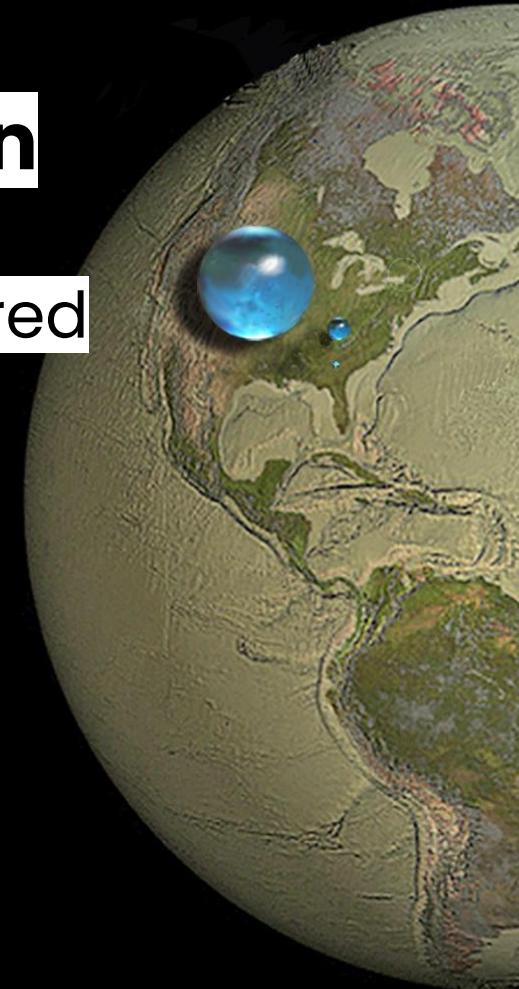
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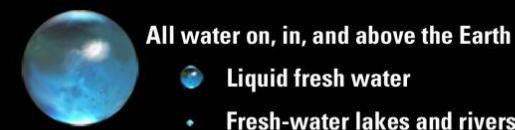
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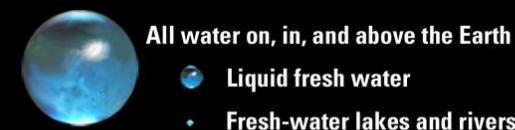
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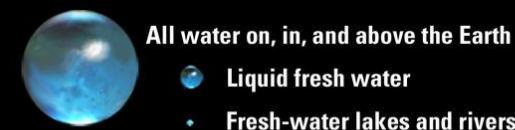
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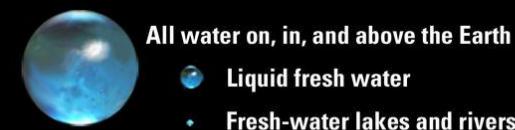
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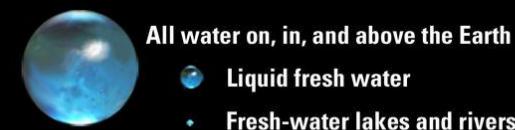
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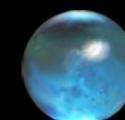
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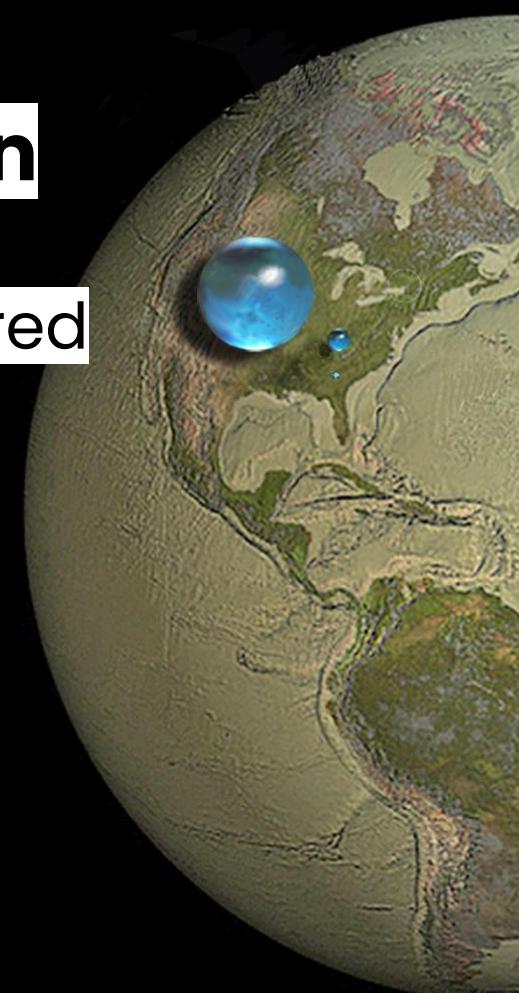
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**Traditional**

**vs.**

**Data-Driven  
Storytelling:**

**Story:**

**Story:**

**Narrative:**

**Narrative**

# **Traditional**

**vs.**

# **Data-Driven Storytelling:**

## **Story:**

- Events, facts

## **Narrative:**

## **Narrative**

# **Traditional**

**vs.**

# **Data-Driven Storytelling:**

## **Story:**

- Events, facts

## **Story:**

## **Narrative:**

- Putting things in context
- Communication
- Order of events
- audience, author, storytelling,
- Story-telling
- medium

## **Narrative**

# Traditional

vs.

# Data-Driven Storytelling:

## Story:

- Events, facts

## Story:

- Facts, insights, messages,
- Processes: *data transformation, selection, aggregation*

## Narrative:

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## Narrative:

- Putting things in context
- Communication
- Order of events
- audience, author, storytelling,
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- medium

## Narrative

- Provide **context**: persons, collection, importance, questions,
- Explain **visualizations**
- Talk to an **audience**
- Take home **message**
- Chose storytelling **medium**



# Session 6

# Traditional Storytelling



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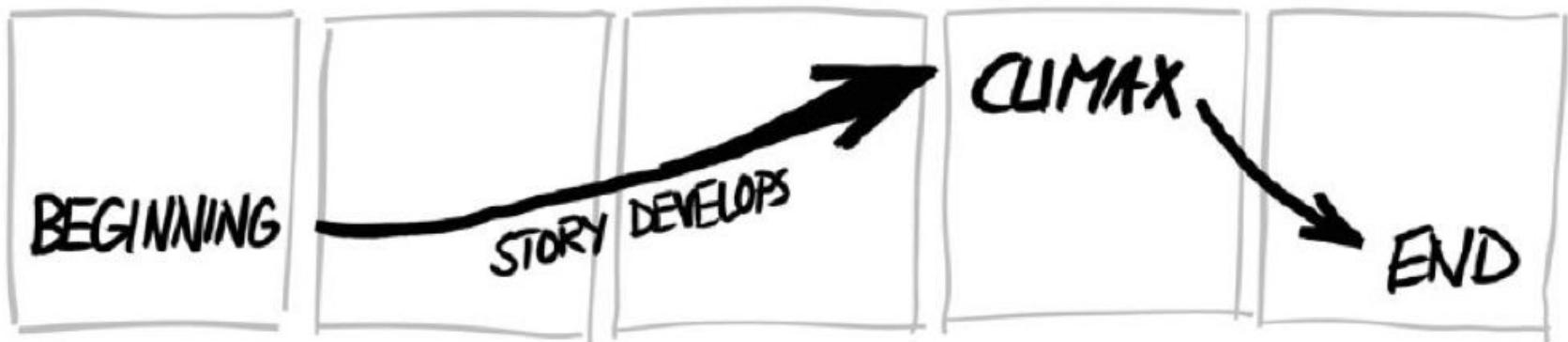
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# Story structure: **Drama**



# Story Structure



# Story Structure



Introduction  
Context  
Problems

...

**Curiosity**

Audience  
reaction



# Story Structure



**Beginning**

**Middle**

**End**

Introduction  
Context  
Problems

...

Events, facts,  
Relations, surprise,  
Findings, insight

...

**Curiosity**

**Understanding**

Audience  
reaction



# Story Structure



**Beginning**

**Middle**

**End**

Introduction  
Context  
Problems  
...

Events, facts,  
Relations, surprise,  
Findings, insight  
...

Conclusion,  
Resolution,  
Take-home  
Call-to-action,  
...

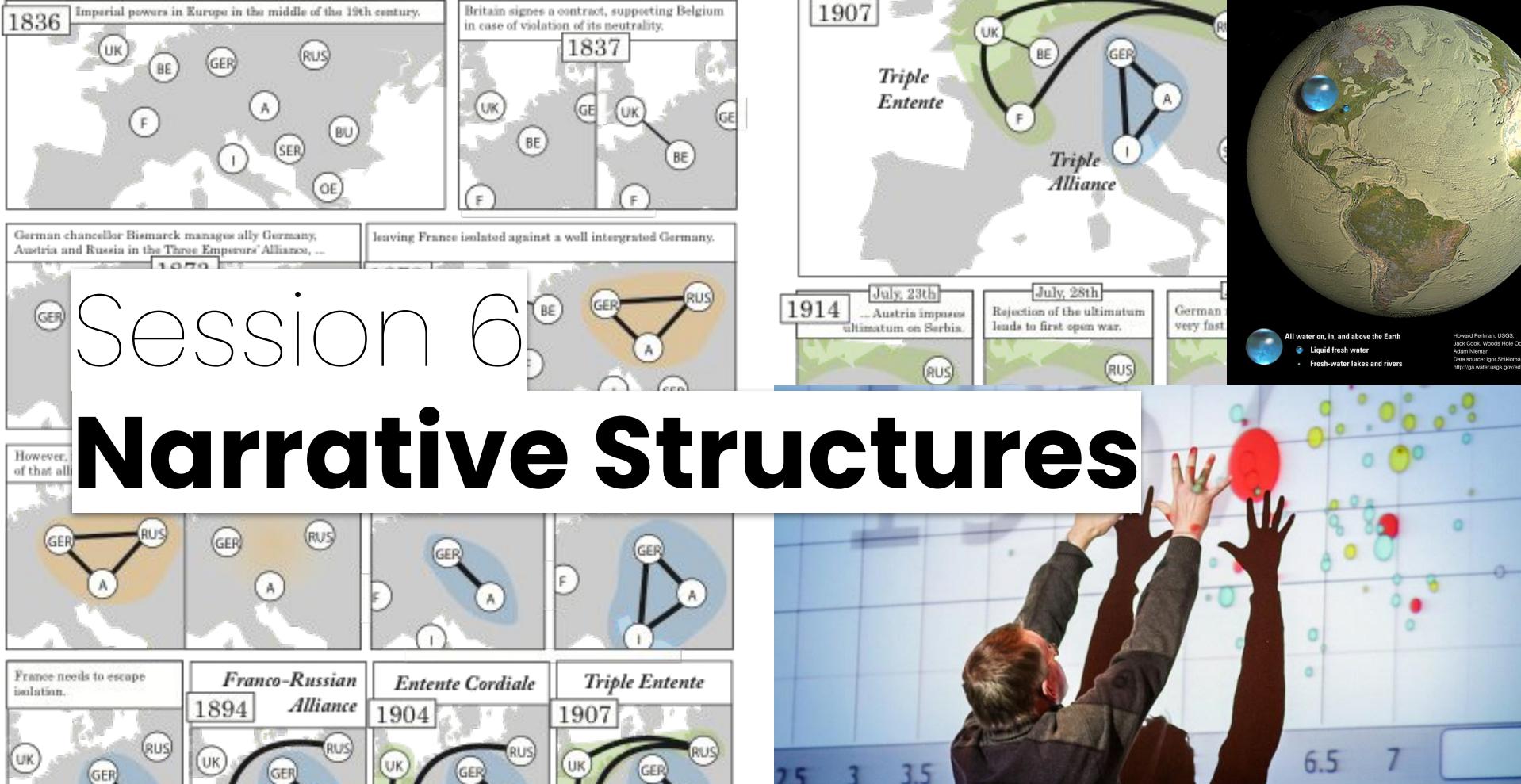
**Curiosity**

**Understanding**

**Action**

Audience  
reaction





# Narrative Structures



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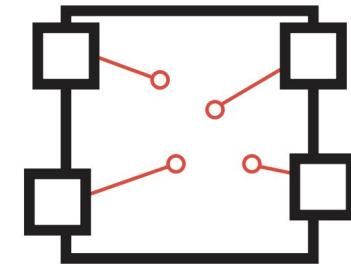
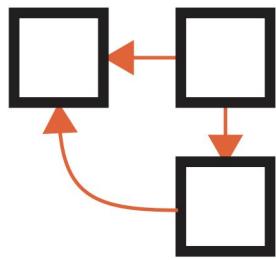


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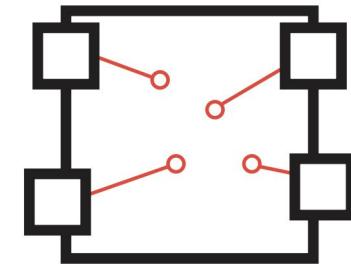
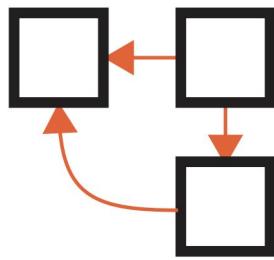


**Author driven**



**Reader driven**

# Narrative Structures



**Author driven**

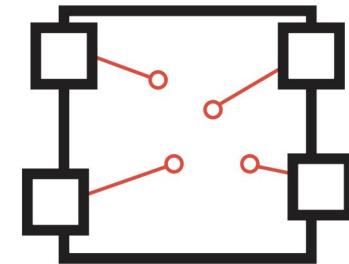
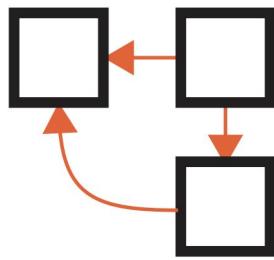
Heavy messaging



**Reader driven**

No messaging

# Narrative Structures



**Author driven**

Heavy messaging

No interactivity

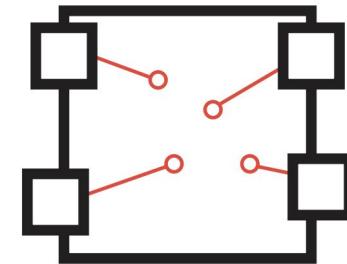
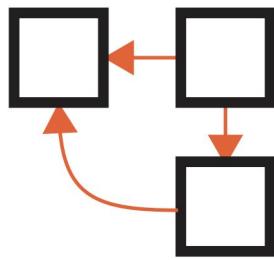


**Reader driven**

No messaging

Free interactivity

# Narrative Structures



## Author driven

Heavy messaging

No interactivity

Linear

## Reader driven

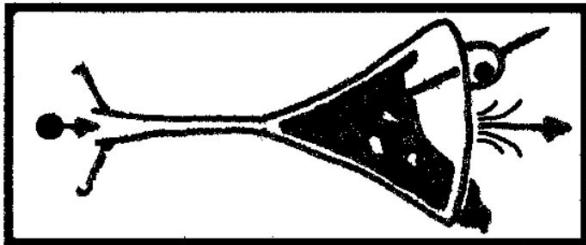
No messaging

Free interactivity

Interactive

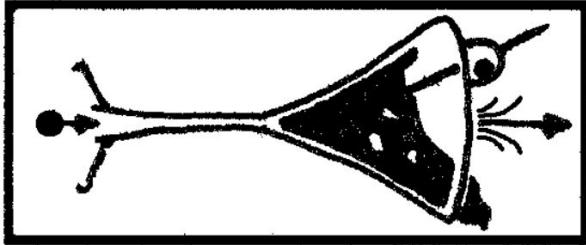


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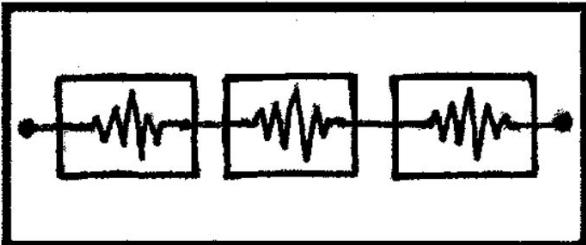


**Martini-glass Structure**  
Guidance first, then exploration

# Narrative Structures

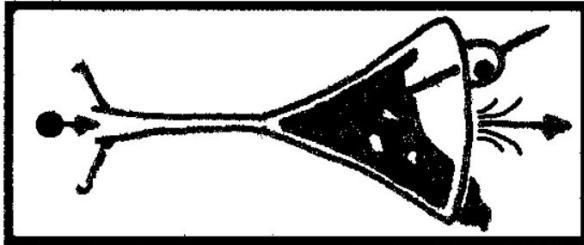


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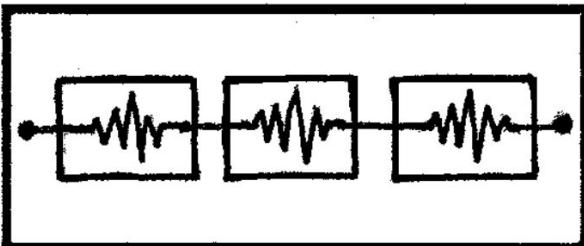


**Interactive slideshow**  
Overall structure  
+ local exploration

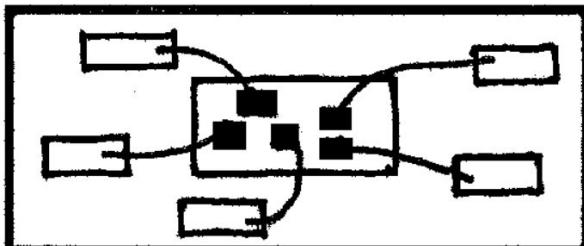
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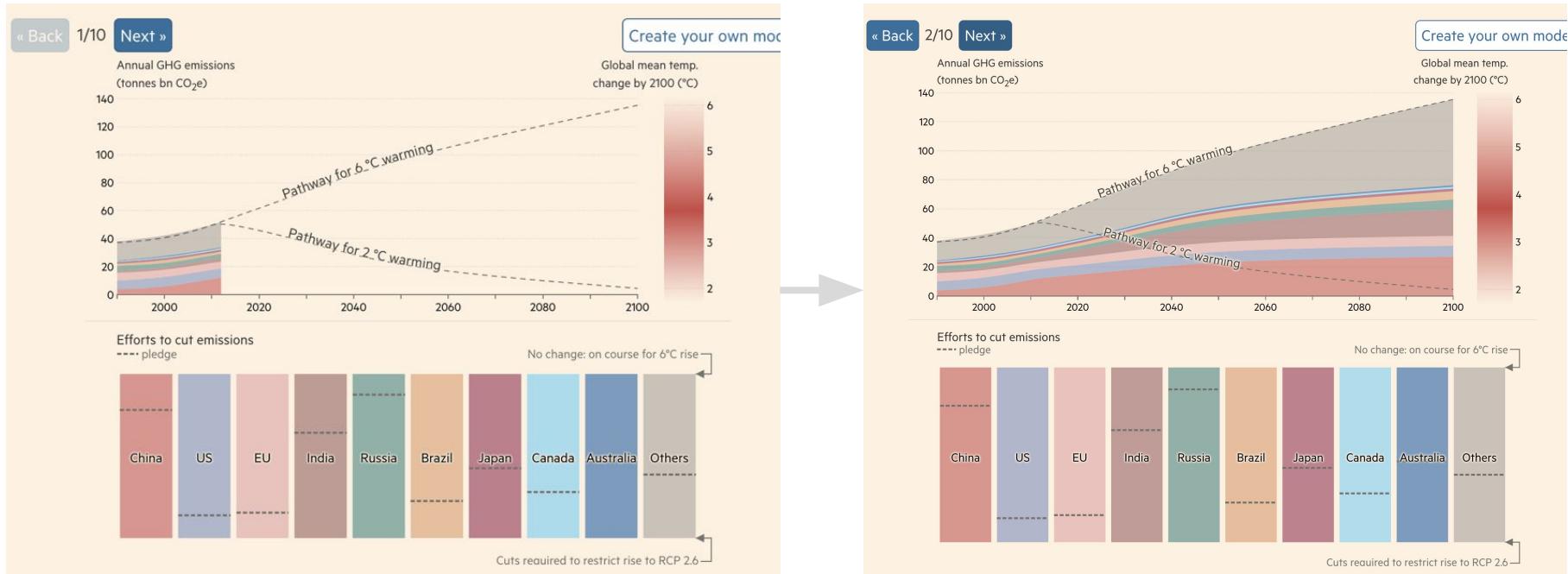


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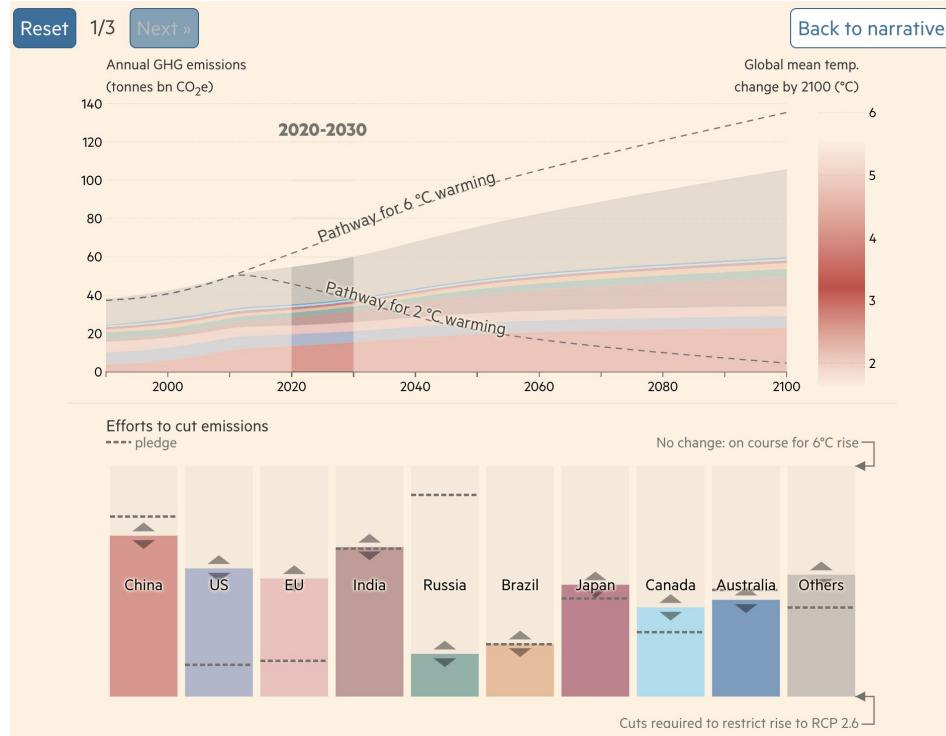
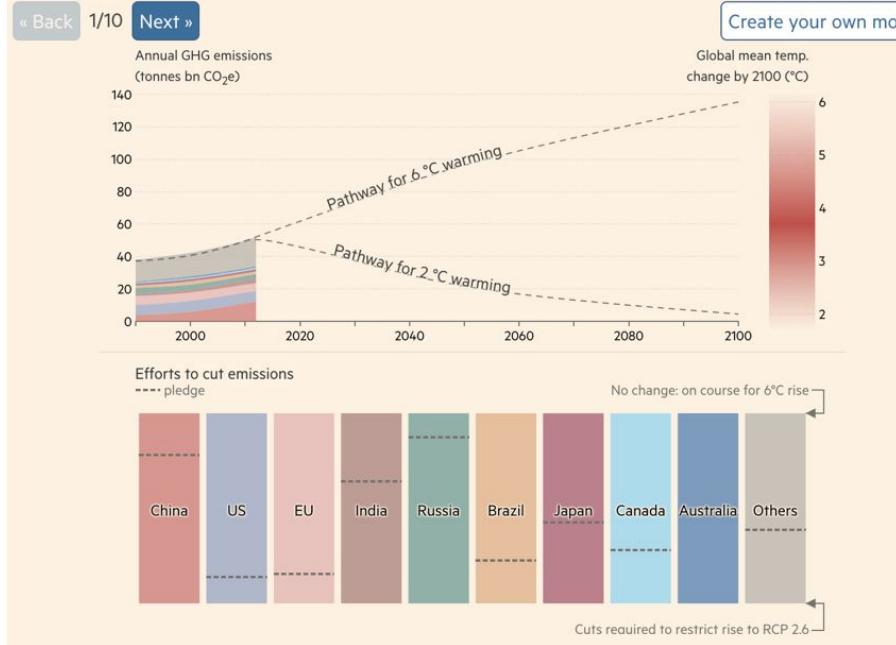


**Drill-down story**  
Largely reader driven

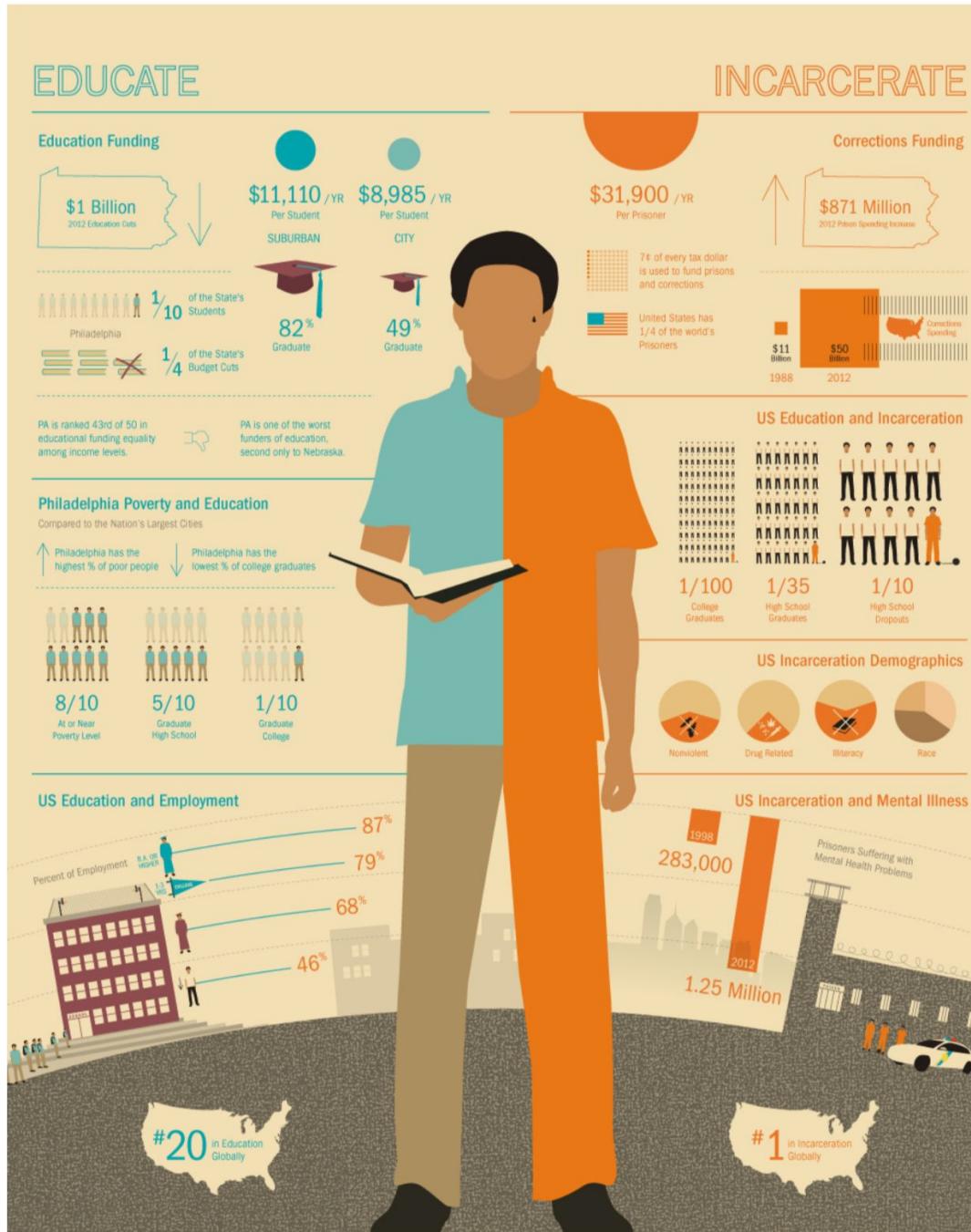
# Narrative structures: Interactive Slideshow



# Narrative structures: Martini-glass Structure



# Narrative structures: Drill-down story





# Narrative Design Patterns



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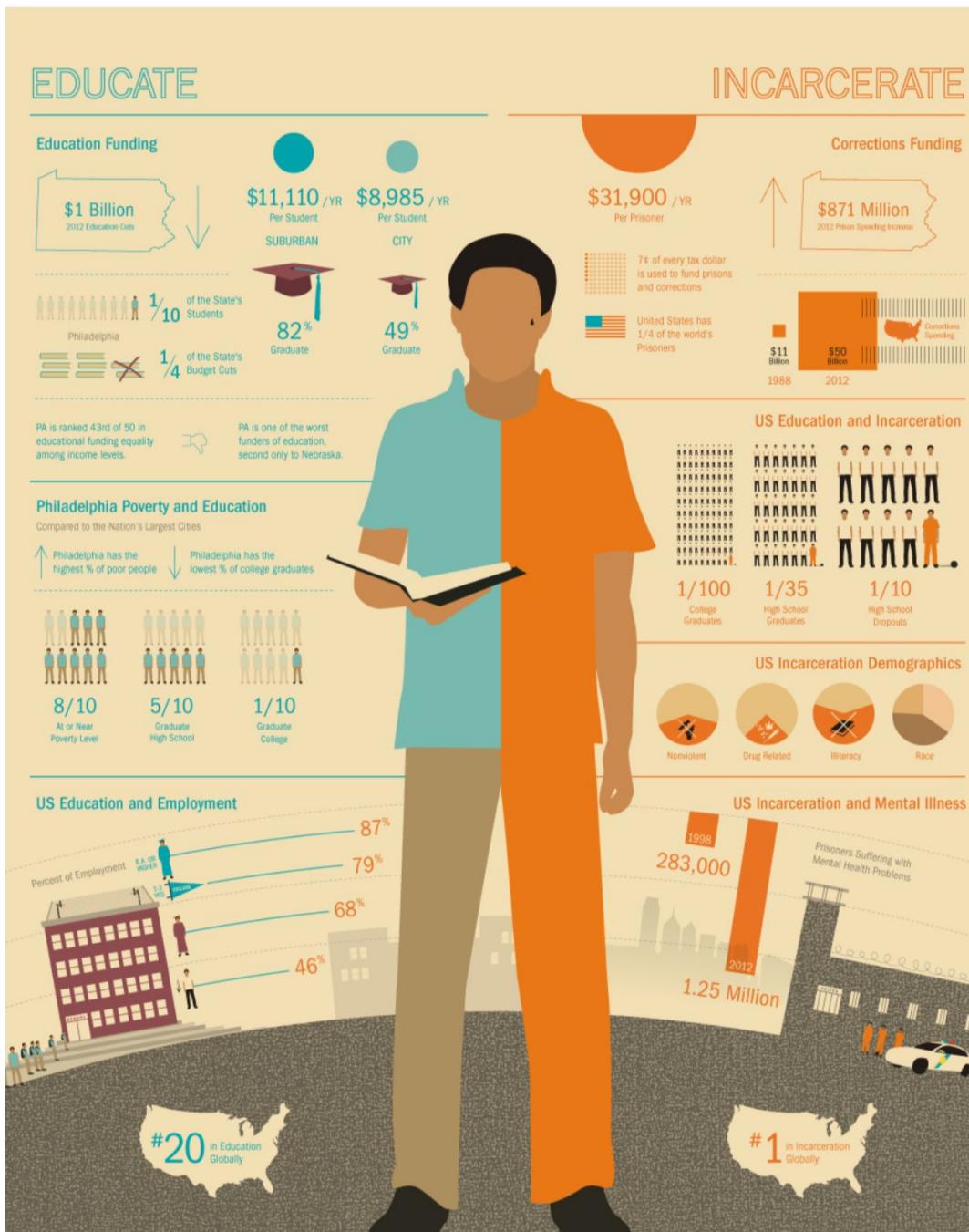


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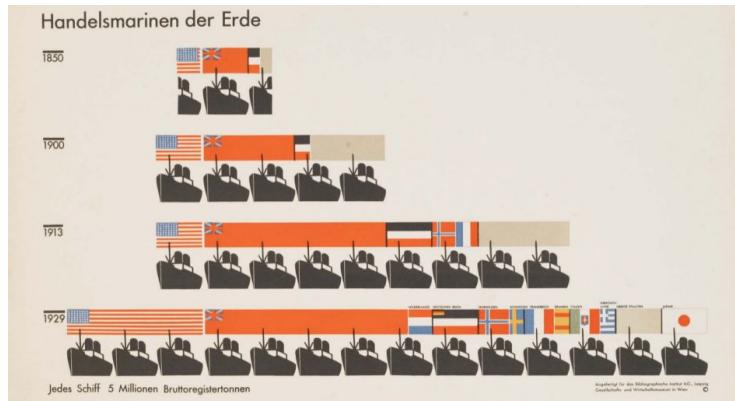
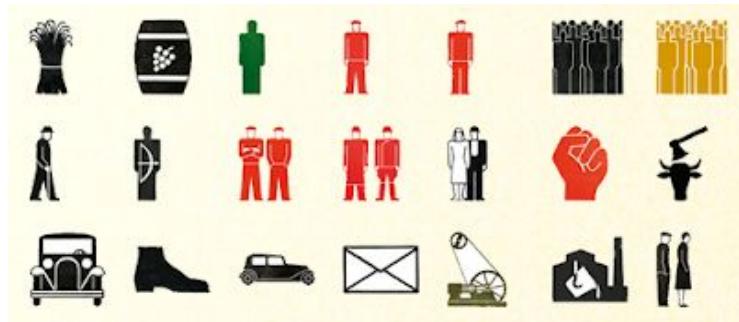
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# Narrative Patterns Contrast

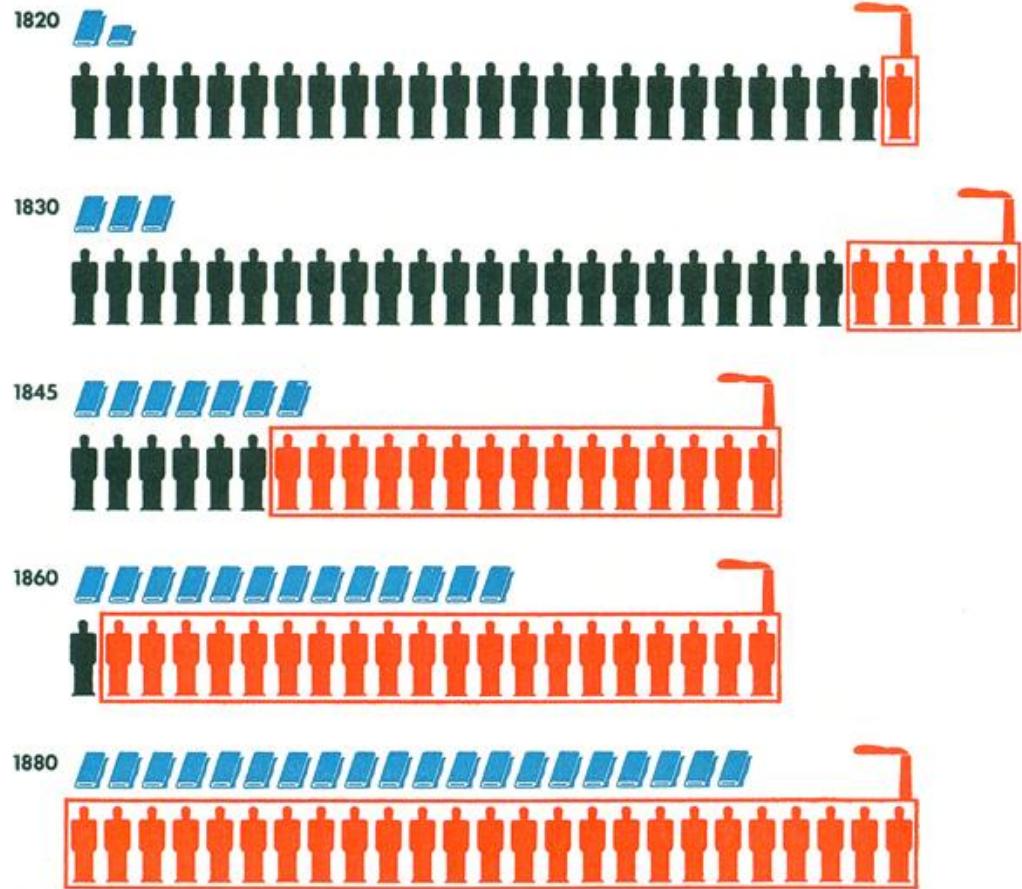


Bach, Benjamin, et al. "Narrative Design Patterns for Data-Driven Storytelling." *Data-Driven Storytelling*. AK Peters/CRC Press, 2018. 125-152.

# Narrative Patterns: **Concretize (ISOTYPE)**



## Home and Factory Weaving in England



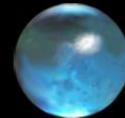
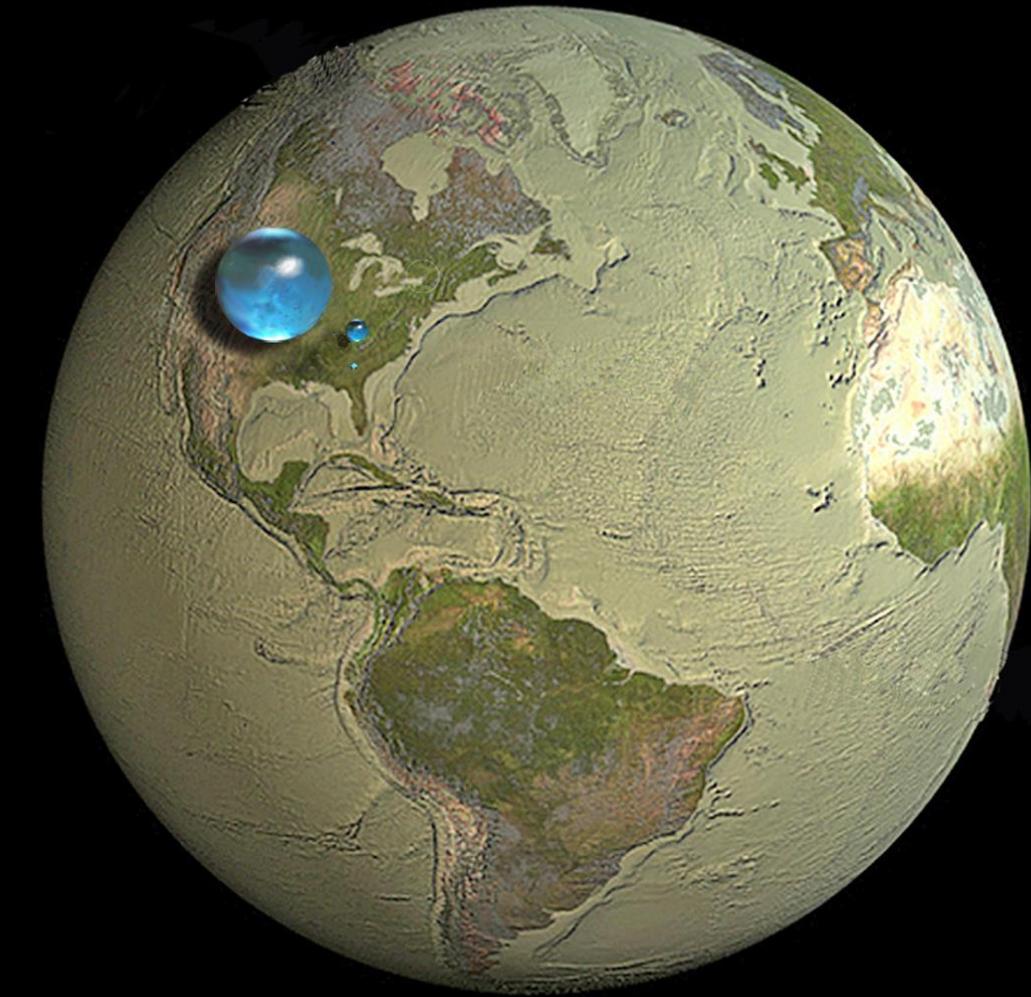
# Scales

\$1 TRILLION & \$20 TRILLION IN PHYSICAL \$100 BILLS



# Scales

## The World's Water

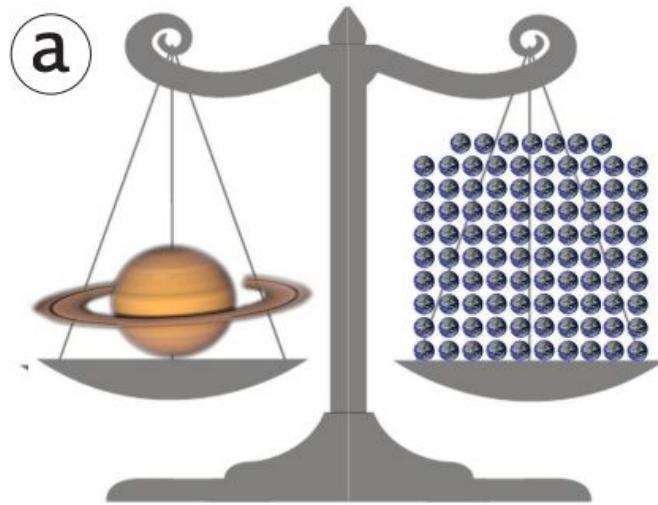


- All water on, in, and above the Earth
  - Liquid fresh water
  - Fresh-water lakes and rivers

Howard Perlman, USGS,  
Jack Cook, Woods Hole Oceanographic Institution,  
Adam Nieman  
Data source: Igor Shiklomanov  
<http://ga.water.usgs.gov/edu/earthhowmuch.html>

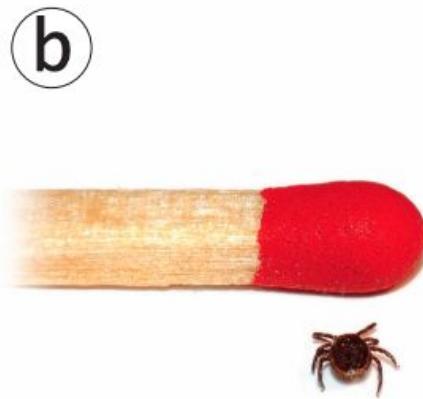
Chevalier, Fanny, Romain Vuillemot, and Guia Gali.  
"Using concrete scales: A practical framework for effective visual depiction of complex measures."  
*IEEE transactions on visualization and computer graphics* 19.12 (2013): 2426-2435.

# Scales

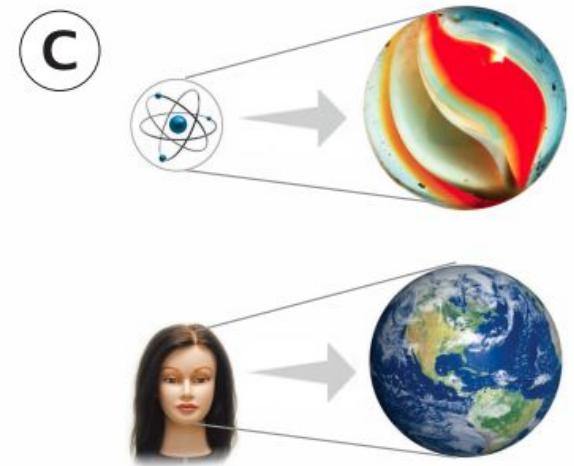


**Quantities**

Chevalier, Fanny, Romain Vuillemot, and Guia Gali.  
"Using concrete scales: A practical framework for effective visual depiction of complex measures."  
*IEEE transactions on visualization and computer graphics* 19.12 (2013): 2426-2435.



**Reference**



**Analogy**

# Narrative Patterns: <http://napa-cards.net>

## NAPA Cards Preview

Narrative Patterns for Data-Driven Storytelling

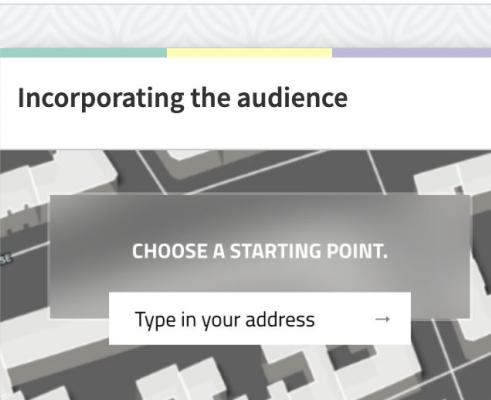
What is  
this?

EMPATHY [4] ENGAGEMENT [3] FRAMING [11] FLOW [3] ARGUMENT [3]

### Incorporating the audience

CHOOSE A STARTING POINT.

Type in your address →



#### HOW

Audience becomes part of the narrative.

#### WHY

Increase empathy, facilitate personal comparisons. Helps make the data and information more personally relevant. To allow reader to use herself as measuring device.

#### EXAMPLE

Ubisoft: Collapse

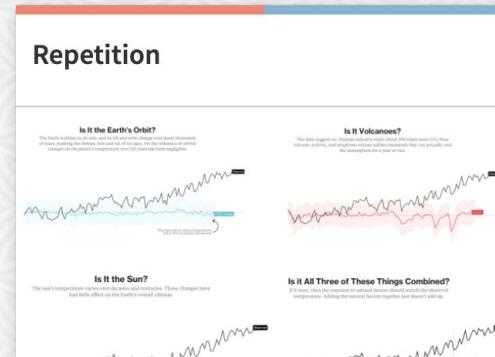
### Repetition

Is It the Earth's Orbit?  
The Earth's orbit is elliptical, and so it's not really change over time (though it's not perfectly elliptical). The Sun's position relative to Earth changes over time, though, so the Sun's position relative to Earth changes over time.

Is It Volcanoes?  
The data suggest the chance of volcanic eruptions has been relatively constant over the last 200 years. There have been some fluctuations, though, so the chance of a volcanic eruption has been relatively constant over time.

Is It the Sun?  
The Sun's temperature is changing over time. These changes have had little effect on the Earth's overall climate.

Is It All Three of These Things Combined?  
The Sun's temperature is changing over time. The Earth's orbit is elliptical, and so it's not really change over time (though it's not perfectly elliptical). The Sun's position relative to Earth changes over time, though, so the Sun's position relative to Earth changes over time.



#### HOW

A phenomenon is re-presented multiple times with changes to the main variable/dimension (the data) or the time frame or the animation pattern (see the example) while other elements of the story don't change. Note: this could be like running multiple simulations with the data to see which is most effective (and in this case, the story would be more reader driven)

#### WHY

To show that the same phenomenon happens over and over again. It also strengthens the narrative through rhythm. Establishing a constant reference frame can help to emphasize change and differences.

Bloomberg: What's really warming the world?

### Juxtaposition

The Billion Dollar Gram  
Bills spent on this. Below is spent on that. It's oil relative right?



#### HOW

Showing two or more complementary visualizations (pictures) juxtaposed.

#### WHY

Compare cases or samples, allows to highlight contrast, difference, absence of difference, change over time. Allows for individual exploration of (minor) differences.

#### EXAMPLE

David McCandless: Billion Dollar Gram



# Session 6

# Storytelling Genres



Online Course  
**Data Visualization  
for Professionals**



THE UNIVERSITY  
of EDINBURGH

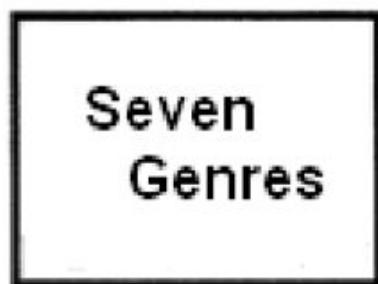
**Benjamin Bach**

June 2022

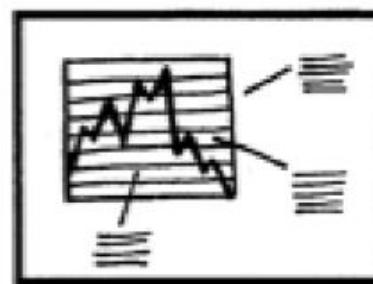
<http://benjbach.me>  
<https://datavis-online.github.io>

-- Not for external use --

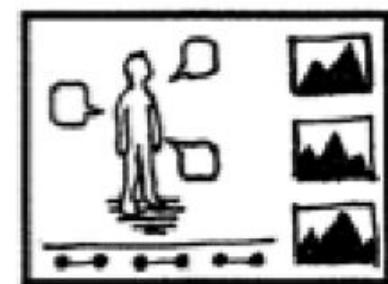
# Seven Genres by Segel & Heer



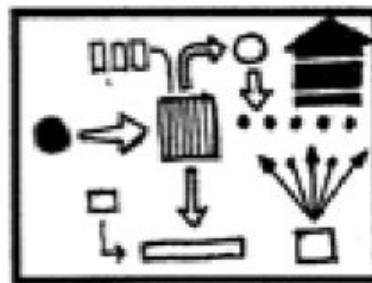
Magazine Style



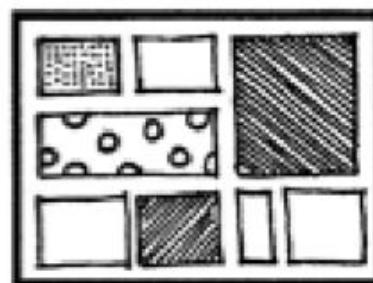
Annotated Chart



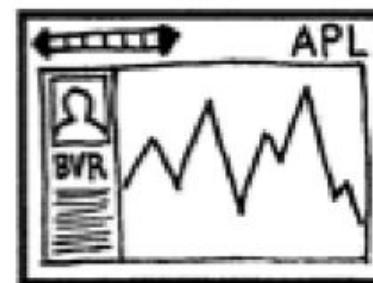
Partitioned Poster



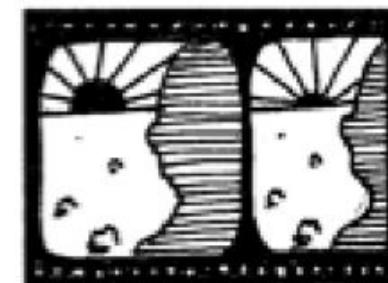
Flow Chart



Comic Strip



Slide Show



Film/Video/Animation

# Seven Genres by Segel & Heer

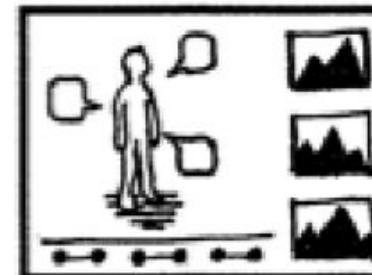
Seven  
Genres



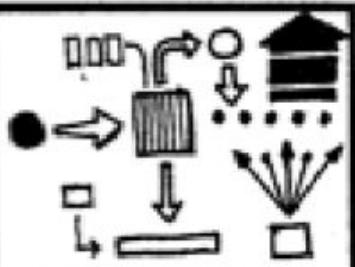
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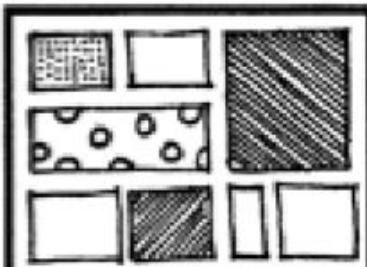
Annotated Chart



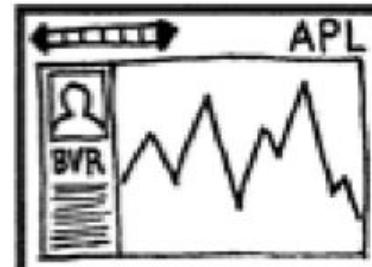
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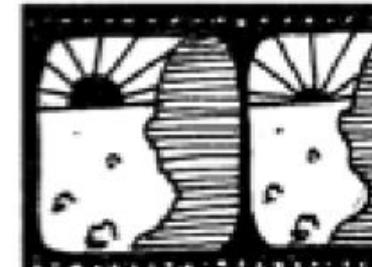
Flow Chart



Comic Strip



Slide Show



Film/Video/Animation

# Magazine Style

physical, social, political, and economic structures of a region can place residents at varying risks for vulnerability. Areas susceptible to violence or natural disaster pose clear threats to individuals. An individual's environment also affects his or her development and behavioral choices. Resources available in the physical and social environments create the contexts within which decisions are made about health, education, and employment. Political and social environments also dictate whether resources are accessible to all adolescents. An examination of the residential distribution of adolescents provides a baseline for comparing geographical patterns of vulnerability. Within Uganda, by type of residence, the majority of adolescents (87 percent) live in rural versus urban areas. Figure 6 shows the distribution of adolescents aged 10 to 19 living in Uganda. Regional distributions show Karamoja contains only four percent of the adolescent population. Kampala with a much denser population contains 4.6 percent of the population. The Eastern and Western regions contain the largest proportions of the adolescent population.

## Household factors influencing vulnerability

Household-level factors have direct impacts on the well-being of adolescents. Households are the primary setting where adolescents live and engage in activities. For this reason, the household environment and the people who live there have significant impacts on the lives of adolescents. Physical conditions of the home influence the health of residents. Family structures and demographic characteristics of household members affect the knowledge, decisions, behaviors and interactions in the environment of the adolescent.

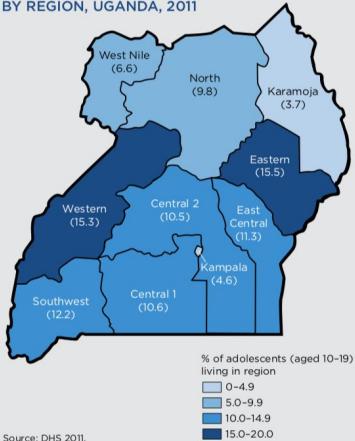
## Access to improved water sources and sanitation

Unsafe water, inadequate sanitation, and poor hygiene are among the five leading risk factors responsible for one quarter of all deaths in the world (WHO 2009). Unsafe water supplies and inadequate sanitation in homes increase exposure to water-borne diseases and can cause diarrhea. Ensuring access to clean water sources and sanitation is key to maintaining hygiene and health. Improved water sources are those that either naturally protect water from contamination or are constructed to do so. These include piped water, public taps, standpipes, boreholes, tube wells, protected wells and springs, and rainwater collection. Improved sanitation includes constructs and systems that prevent fecal contamination. These include flush or pour toilets, ventilated pit latrines, pit latrines with slabs, and composting toilets (UNICEF 2013b).

Housing conditions across East and Southern Africa are largely in need of improvement, and lack of improved sanitation varies by country. In nearly all of East and Southern Africa, over half of adolescents either do not have improved sanitation or share facilities with other households. Conditions are worst in Madagascar and Mozambique where fewer than four percent of adolescents live in households with improved sanitation that is not shared (Figure 7). Rwanda has the lowest proportion of adolescents affected—35 percent—which is still unacceptably high. Lack of access to improved water sources affects lower proportions but is still a problem in the region. In five countries, fewer than half of adolescents have access to improved water sources (Figure 8). Water conditions are best in Namibia, where only 15 percent of adolescents have no access to improved water.

In Uganda, overall access to improved water and sanitation increased by a small but significant percentage between 2006 and 2011 (Figure 9). In 2006, 33 percent of adolescents had no access to improved water; in 2011, it is 30 percent. The proportion of adolescents without access to improved

**FIGURE 6**  
PROPORTION OF ADOLESCENTS AGED 10-19  
BY REGION, UGANDA, 2011



**FIGURE 7**

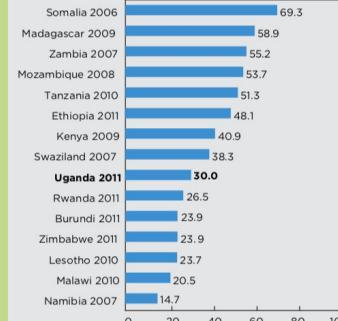
PERCENT OF ADOLESCENTS AGED 10-19  
LIVING IN HOUSEHOLDS WITH NO  
IMPROVED OR WITH SHARED SANITATION,  
EAST AND SOUTHERN AFRICA



Source: DHS 2007-2011; MICS 2006-2008.

**FIGURE 8**

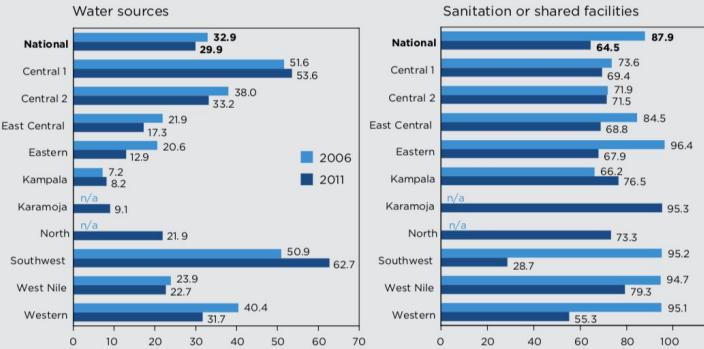
PERCENT OF ADOLESCENTS AGED  
10-19 LIVING IN HOUSEHOLDS WITH  
NO IMPROVED WATER SOURCE, EAST  
AND SOUTHERN AFRICA



Source: DHS 2007-2011; MICS 2006-2008.

**FIGURE 9**

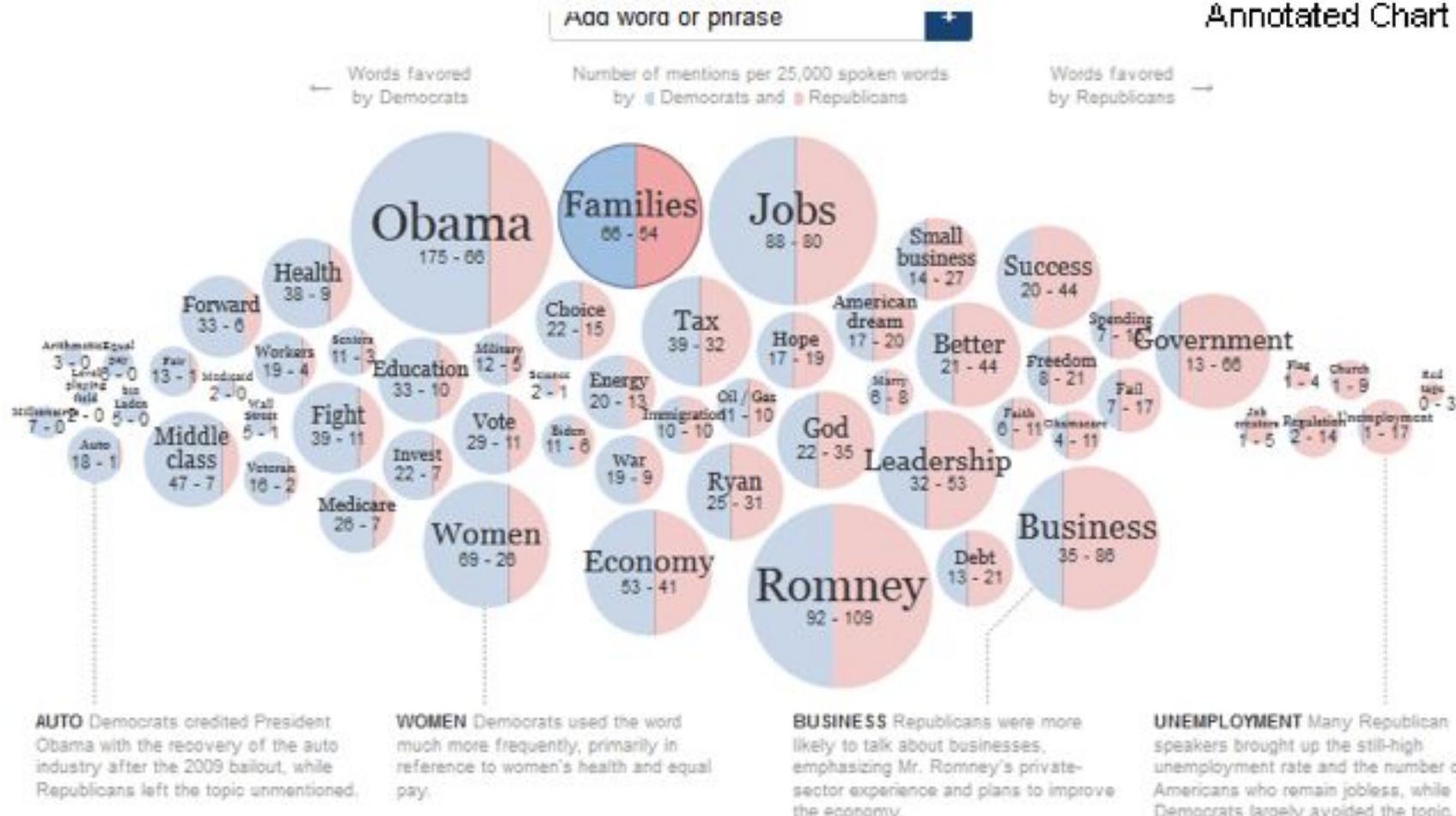
PERCENT OF ADOLESCENTS AGED 10-19 LIVING IN HOUSEHOLDS WITHOUT ACCESS TO  
IMPROVED WATER AND WITHOUT ACCESS TO IMPROVED OR WITH SHARED SANITATION, IN  
UGANDA, BY REGION, 2006 AND 2011



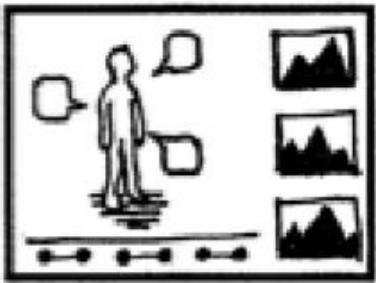
Source: DHS 2006 and 2011.

Note: Changes to the geographic boundaries were made to the North region in the 2011 DHS. The 2006 DHS North region is now divided into the North and Karamoja. For this reason, rates for 2006 are not shown for the North since it is not comparable and Karamoja was not identified in the previous survey.

# Annotated Chart



# Partitioned Poster (Infographic)



Partitioned Poster

<https://www.visualcinnamon.com/portfolio/baby-spike>

## GRAPHIC SCIENCE

The Average  
7.3 babies born  
per minute

Eat First  
More births of all types  
occur right after lunch

### Day Shift

Births peak around 8 A.M.,  
then rise again between noon  
and 1 P.M. Hospitals typically  
have more doctors and nurses  
on hand during the morning  
and fewer later in the day.

The Average  
447 babies born per hour

Fewest Births  
Sunday night  
between 2 and 3 A.M.

### Early Riser

More babies than average  
are born on weekdays during  
daylight hours. Fewer are  
born on weekends or at night,  
primarily because fewer  
hospital staffers are on duty,  
so women tend not to schedule  
their delivery then. Despite  
folklore, a full moon has no effect.

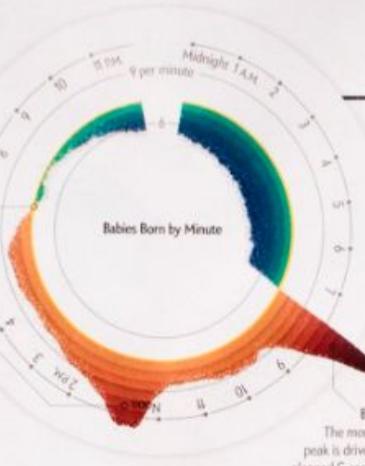
The Average  
77,000 babies born per week

No, Thanks  
Moms do not schedule C-sections  
around Thanksgiving

Happy Holidays  
Babies seem to arrive  
nine months after Christmas  
and New Year's Eve

### Summer Son

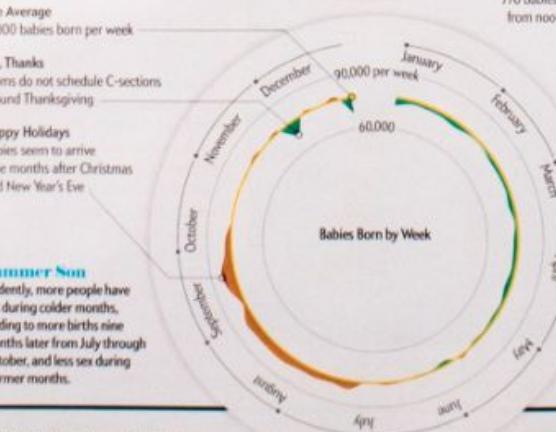
Evidently, more people have  
sex during colder months,  
leading to more births nine  
months later from July through  
October, and less sex during  
warmer months.



The morning  
peak is driven by  
planned C-sections



Midday Special  
On a typical Tuesday,  
770 babies are born  
from noon to 1 P.M.



## The Baby Spike

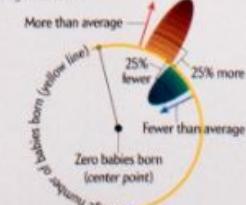
Births peak on  
weekdays during  
daytime work hours

**Two generations ago** babies were born pretty much spontaneously, around the clock. But today in the U.S., about half of all births are cesarean sections prescheduled by Mom or deliveries induced by doctors concerned about the mother's or baby's health. These medical procedures have skewed the days of the week, and hours of the day, during which those little bundles of joy arrive.

The procedures dominate because more than 98 percent of infants are born in a hospital, despite what seems to be the rising popularity of home births. Far more babies now arrive on weekdays than on weekends, most between 8 A.M. and 6 P.M. "We can't schedule spontaneous labor, obviously," says Neel Shah, a physician and professor at Harvard Medical School. "But we can schedule delivery."

—Mark Fischetti and Zan Armstrong

Each graph shows U.S. data  
averaged across 2014



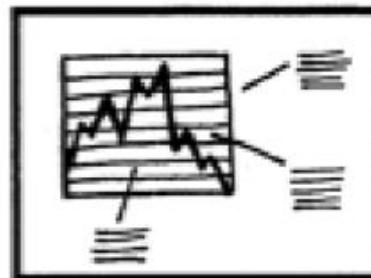
SOURCE: U.S. CENTER FOR DISEASE CONTROL AND PREVENTION, 2014

# Slide Shows

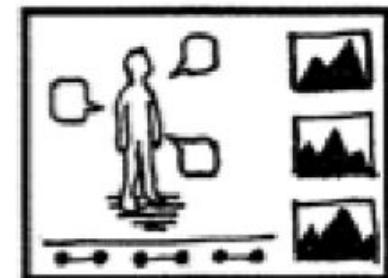
Seven  
Genres



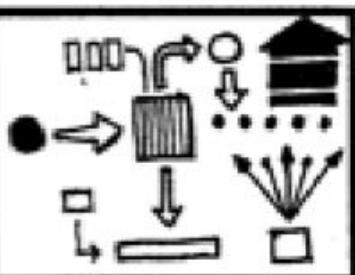
Magazine Style



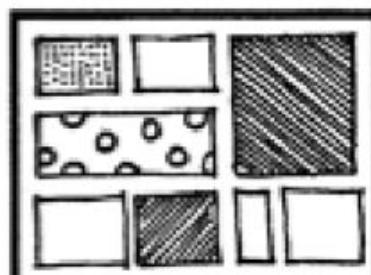
Annotated Chart



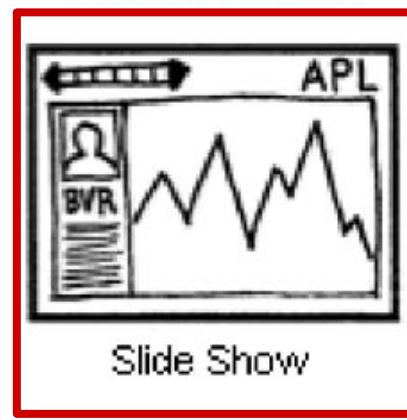
Partitioned Poster



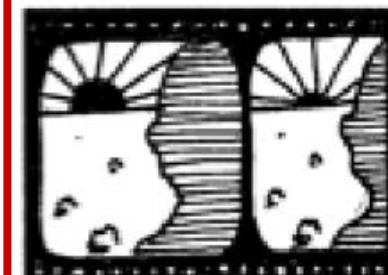
Flow Chart



Comic Strip



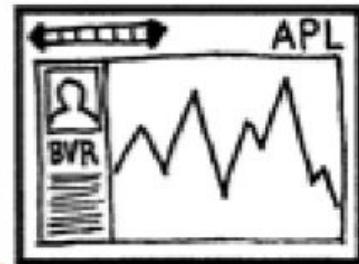
Slide Show



Film/Video/Animation

# Slideshow

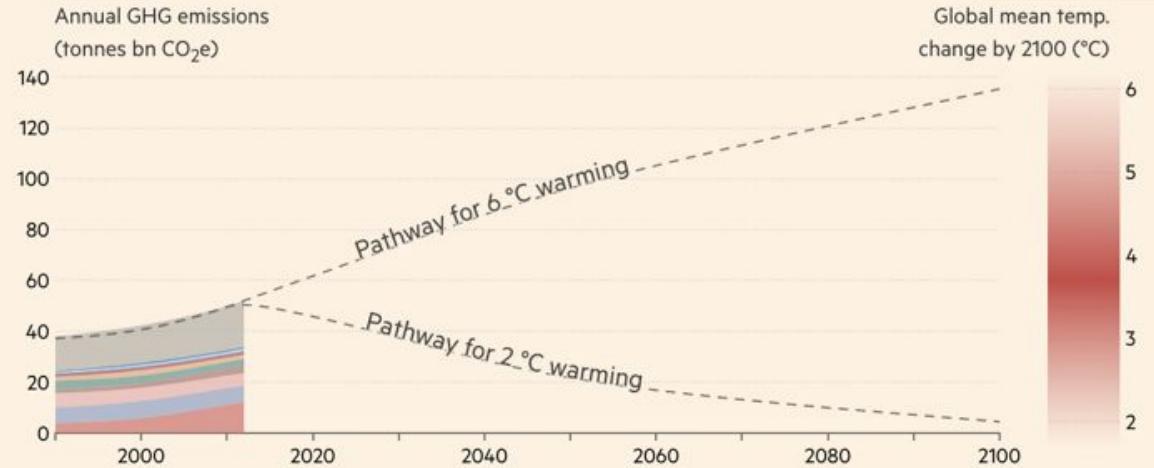
<https://ig.ft.com/sites/climate-change-calculator/>



Slide Show

« Back 1/10 Next »

Create your own mod



Efforts to cut emissions

---- pledge

No change: on course for 6°C rise



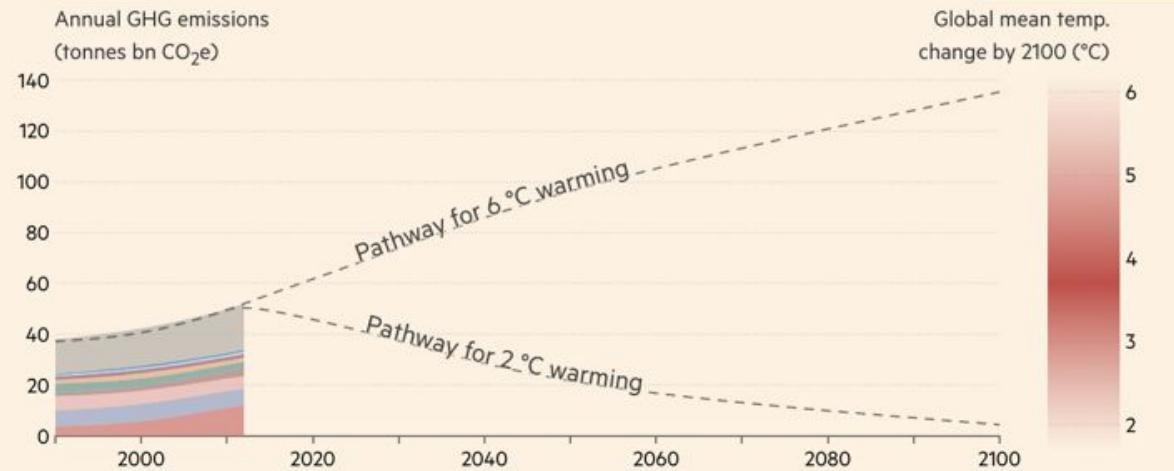
# Interactive

« Back

1/10

Next »

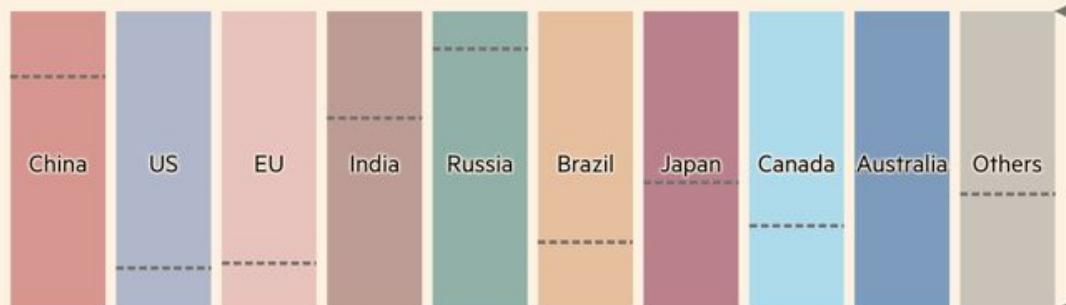
Create your own model



Efforts to cut emissions

---- pledge

No change: on course for 6°C rise

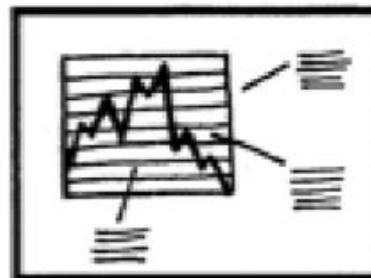


# Data Videos

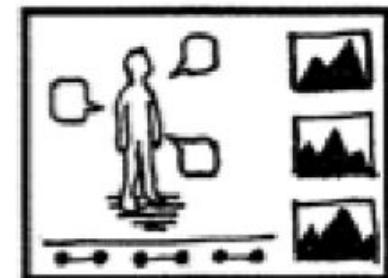
Seven  
Genres



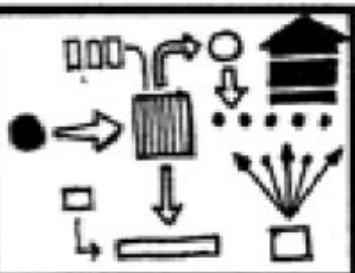
Magazine Style



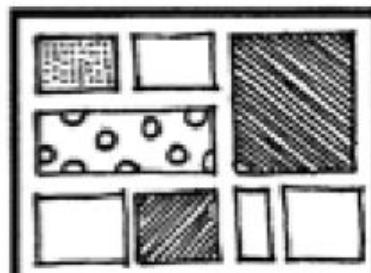
Annotated Chart



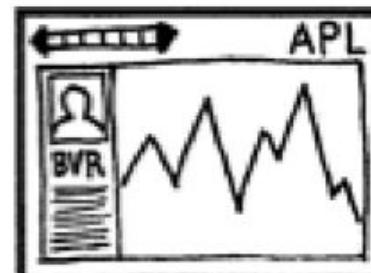
Partitioned Poster



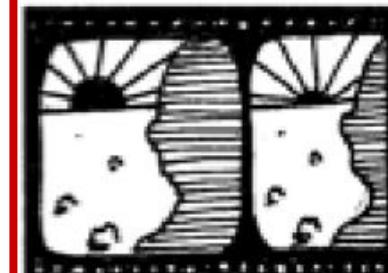
Flow Chart



Comic Strip

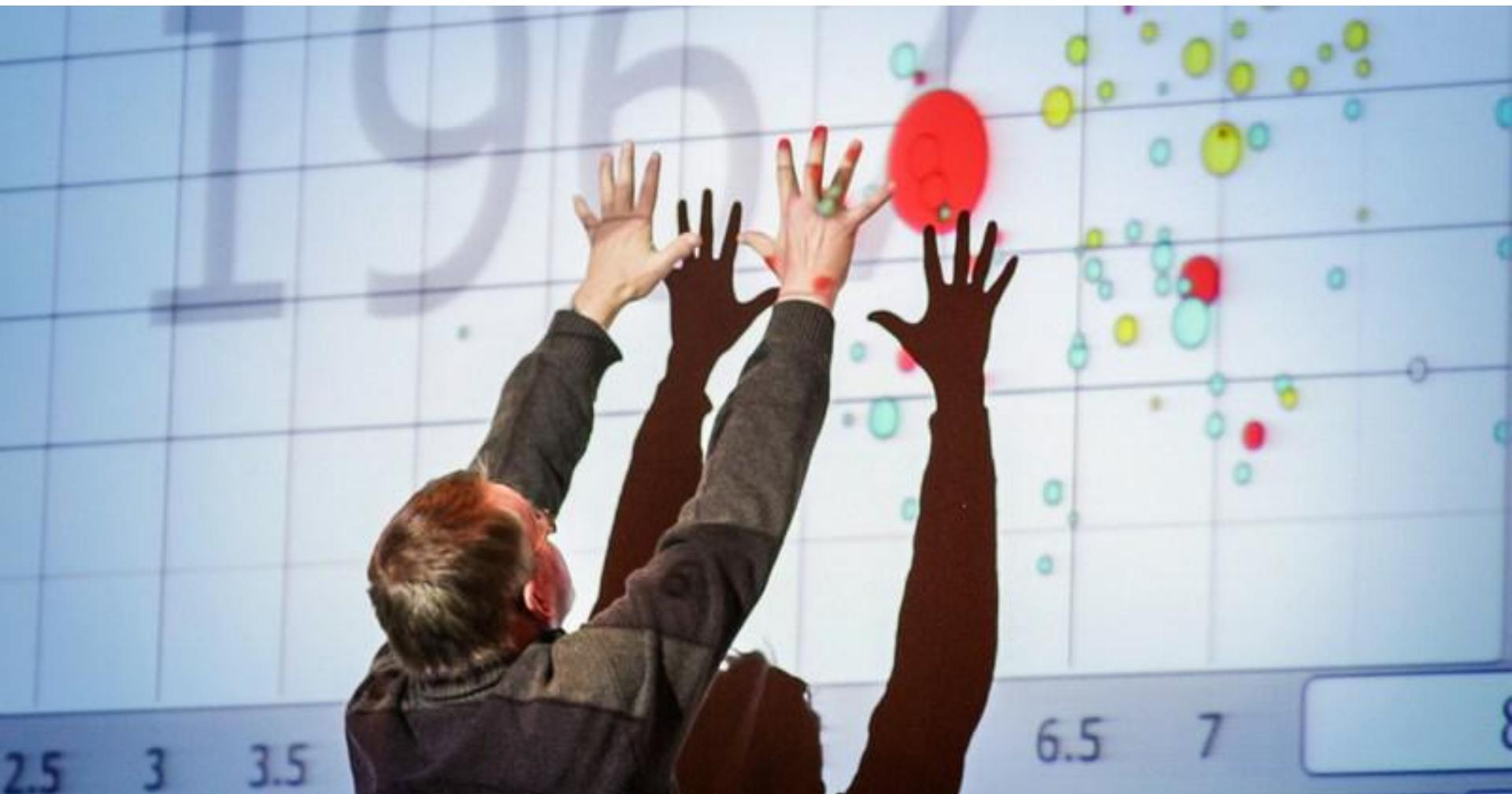


Slide Show



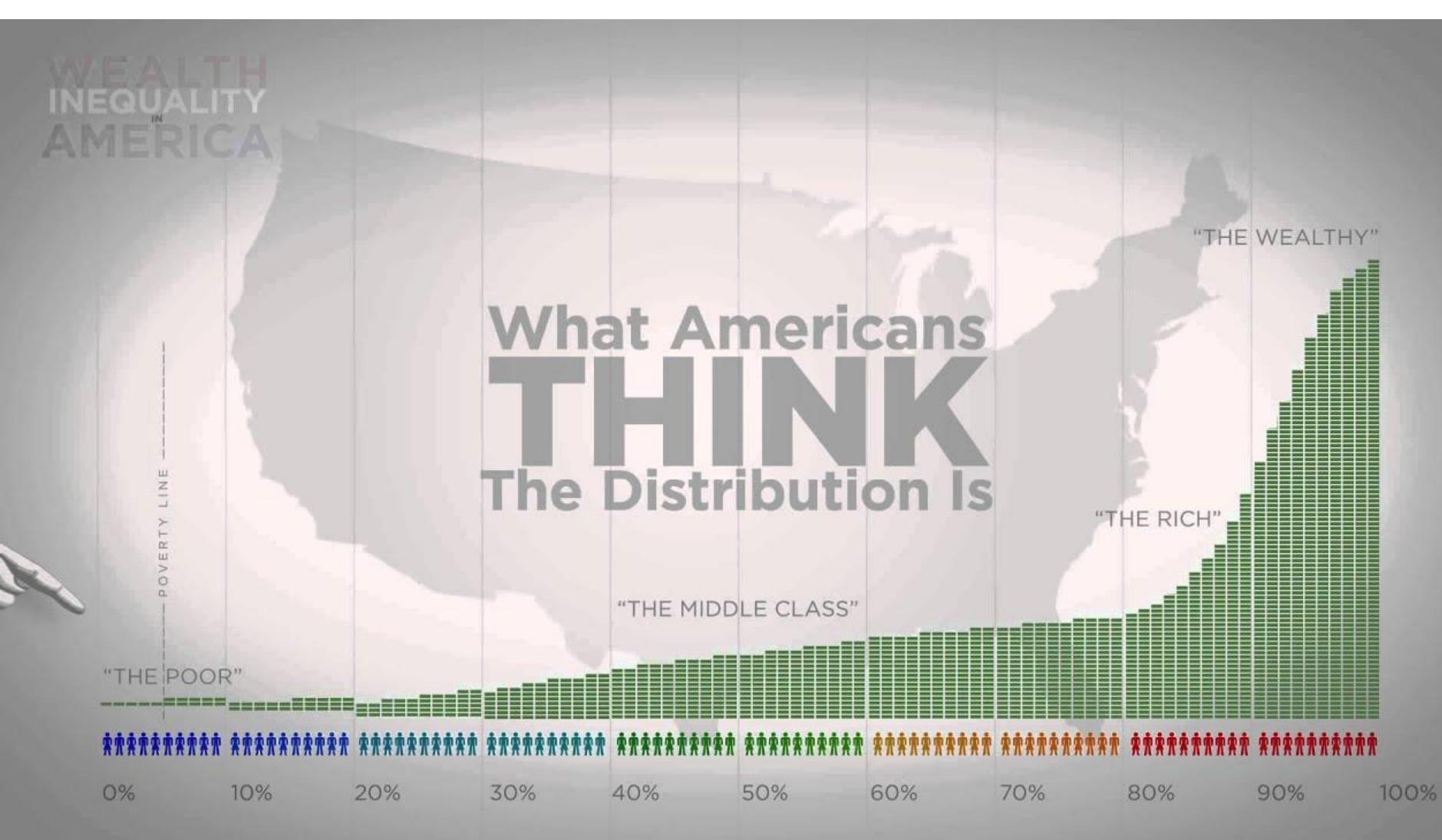
Film/Video/Animation

# Life Presentations



[https://www.ted.com/talks/hans\\_rosling\\_shows\\_the\\_best\\_stats\\_you\\_ve\\_ever\\_seen?language=en](https://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen?language=en)

# Data Videos

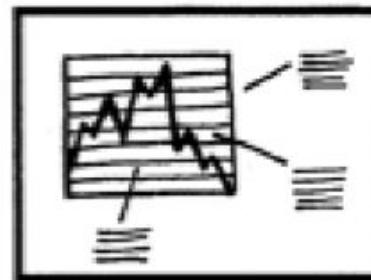


# Data Comics

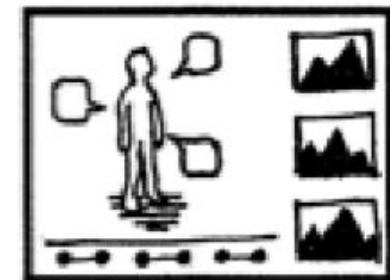
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Genres



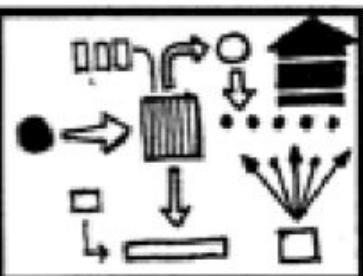
Magazine Style



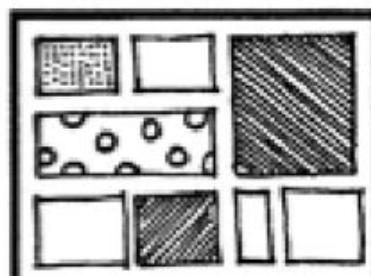
Annotated Chart



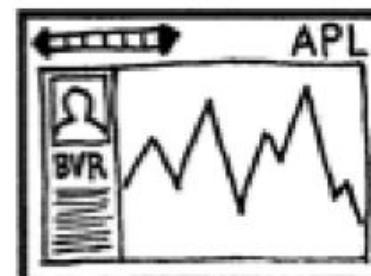
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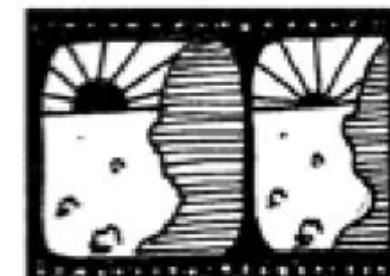
Flow Chart



Comic Strip



Slide Show



Film/Video/Animation

# Report

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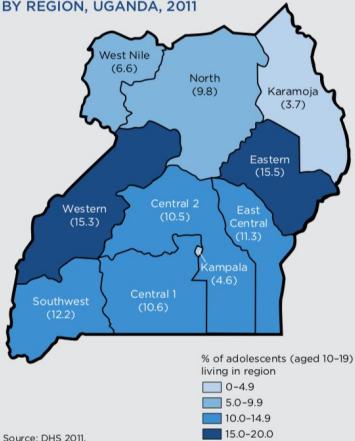
## Access to improved water sources and sanitation

Unsafe water, inadequate sanitation, and poor hygiene are among the five leading risk factors responsible for one quarter of all deaths in the world (WHO 2009). Unsafe water supplies and inadequate sanitation in homes increase exposure to water-borne diseases and can cause diarrhea. Ensuring access to clean water sources and sanitation is key to maintaining hygiene and health. Improved water sources are those that either naturally protect water from contamination or are constructed to do so. These include piped water, public taps, standpipes, boreholes, tube wells, protected wells and springs, and rainwater collection. Improved sanitation includes constructs and systems that prevent fecal contamination. These include flush or pour toilets, ventilated pit latrines, pit latrines with slabs, and composting toilets (UNICEF 2013b).

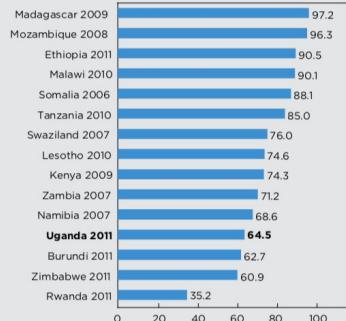
Housing conditions across East and Southern Africa are largely in need of improvement, and lack of improved sanitation varies by country. In nearly all of East and Southern Africa, over half of adolescents either do not have improved sanitation or share facilities with other households. Conditions are worst in Madagascar and Mozambique where fewer than four percent of adolescents live in households with improved sanitation that is not shared (Figure 7). Rwanda has the lowest proportion of adolescents affected—35 percent—which is still unacceptably high. Lack of access to improved water sources affects lower proportions but is still a problem in the region. In five countries, fewer than half of adolescents have access to improved water sources (Figure 8). Water conditions are best in Namibia, where only 15 percent of adolescents have no access to improved water.

In Uganda, overall access to improved water and sanitation increased by a small but significant percentage between 2006 and 2011 (Figure 9). In 2006, 33 percent of adolescents had no access to improved water; in 2011, it is 30 percent. The proportion of adolescents without access to improved

**FIGURE 6**  
PROPORTION OF ADOLESCENTS AGED 10-19  
BY REGION, UGANDA, 2011

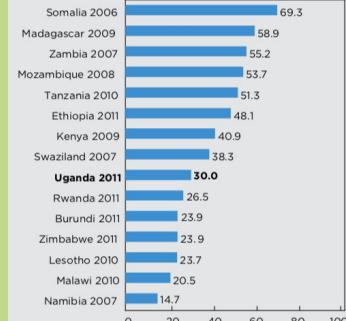


**FIGURE 7**  
PERCENT OF ADOLESCENTS AGED 10-19  
LIVING IN HOUSEHOLDS WITH NO  
IMPROVED OR WITH SHARED SANITATION,  
EAST AND SOUTHERN AFRICA



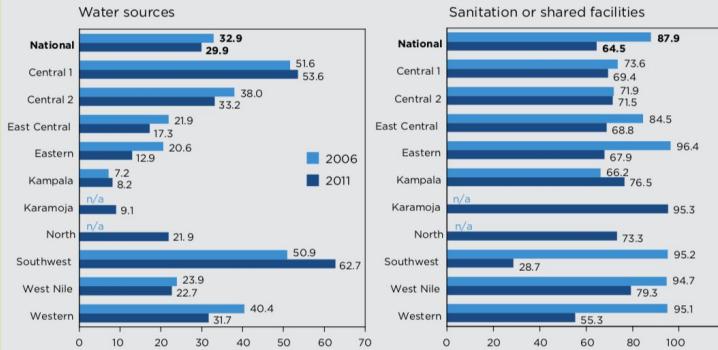
Source: DHS 2007-2011; MICS 2006-2008.

**FIGURE 8**  
PERCENT OF ADOLESCENTS AGED  
10-19 LIVING IN HOUSEHOLDS WITH  
NO IMPROVED WATER SOURCE, EAST  
AND SOUTHERN AFRICA



Source: DHS 2007-2011; MICS 2006-2008.

**FIGURE 9**  
PERCENT OF ADOLESCENTS AGED 10-19 LIVING IN HOUSEHOLDS WITHOUT ACCESS TO  
IMPROVED WATER AND WITHOUT ACCESS TO IMPROVED OR WITH SHARED SANITATION, IN  
UGANDA, BY REGION, 2006 AND 2011



Source: DHS 2006 and 2011.  
Note: Changes to the geographic boundaries were made to the North region in the 2011 DHS. The 2006 DHS North region is now divided into the North and Karamoja. For this reason, rates for 2006 are not shown for the North since it is not comparable and Karamoja was not identified in the previous survey.

# Panel (sequences)

I just came back from  
Boston to Paris.

5500km in just 6h.



That produced 1 ton of CO<sub>2</sub>.



# Panel (sequences)

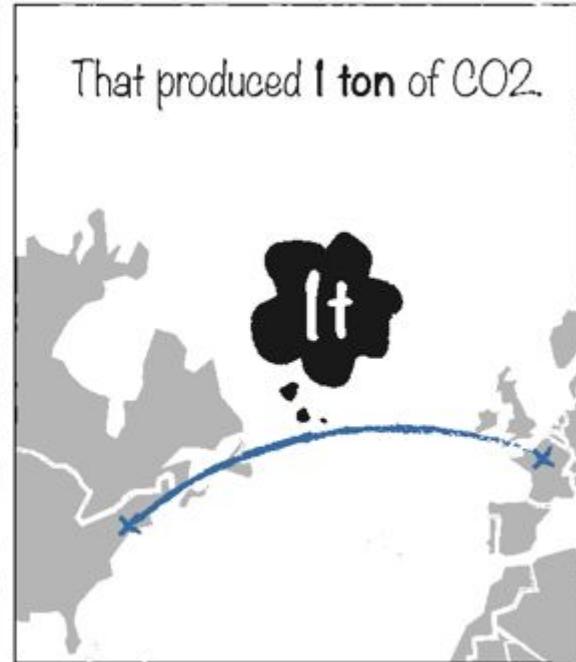
I just came back from  
Boston to Paris.



5500km in just 6h.

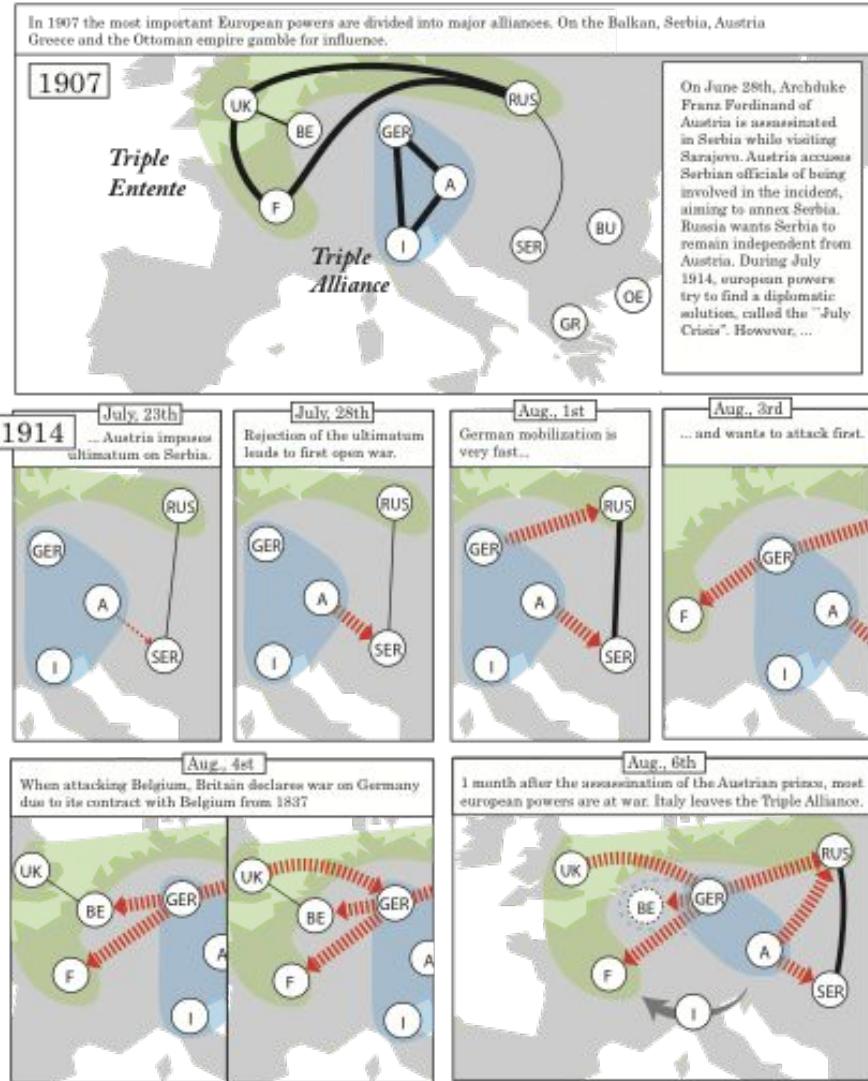
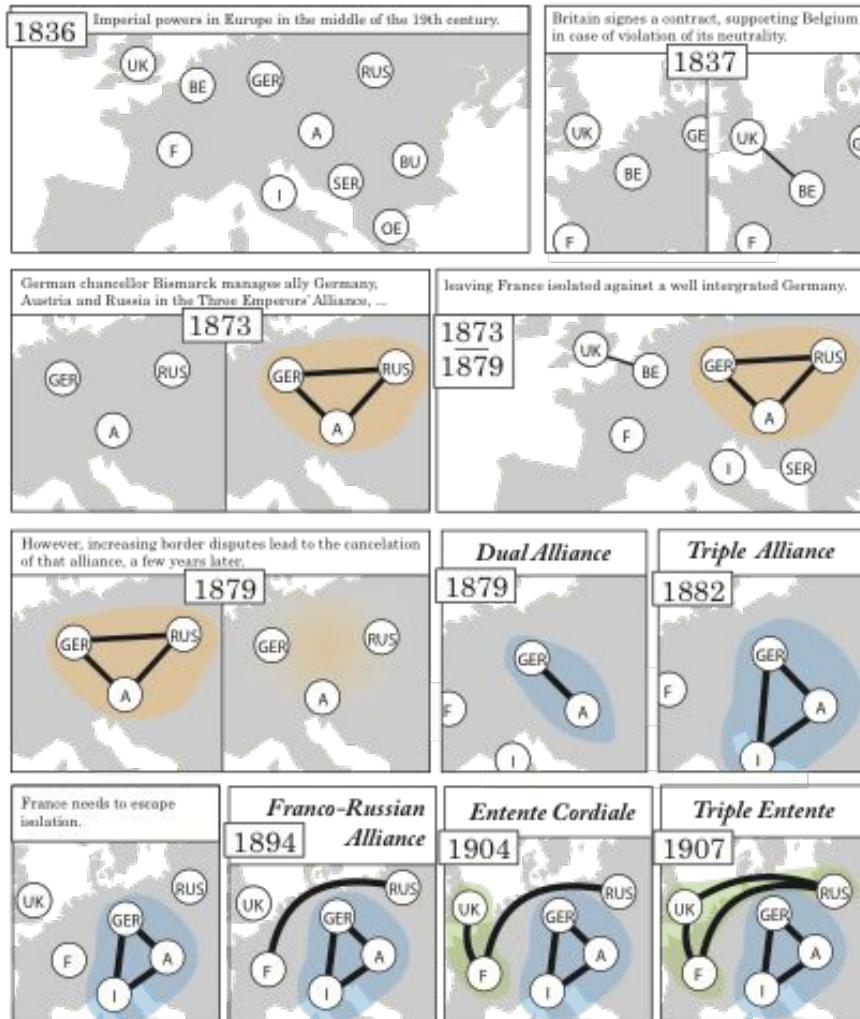


That produced **1 ton** of CO<sub>2</sub>.



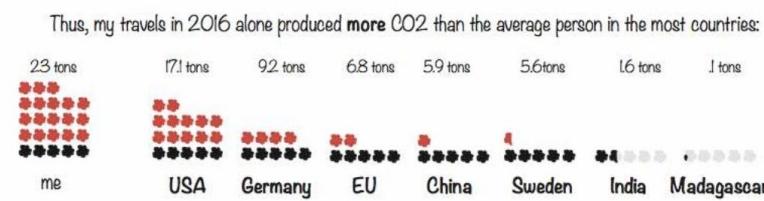
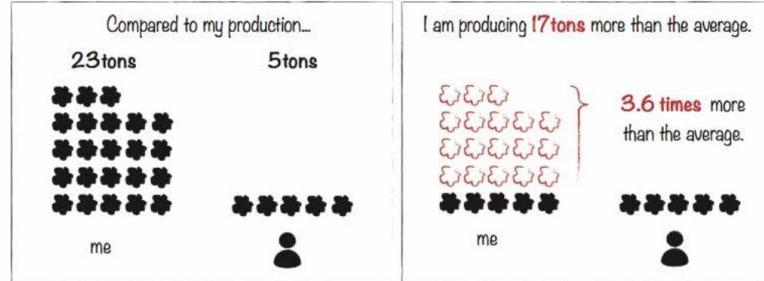
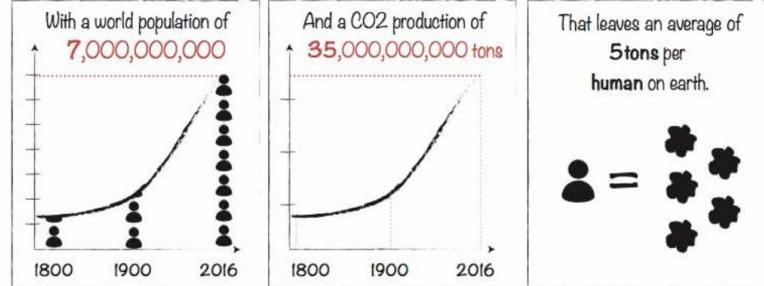
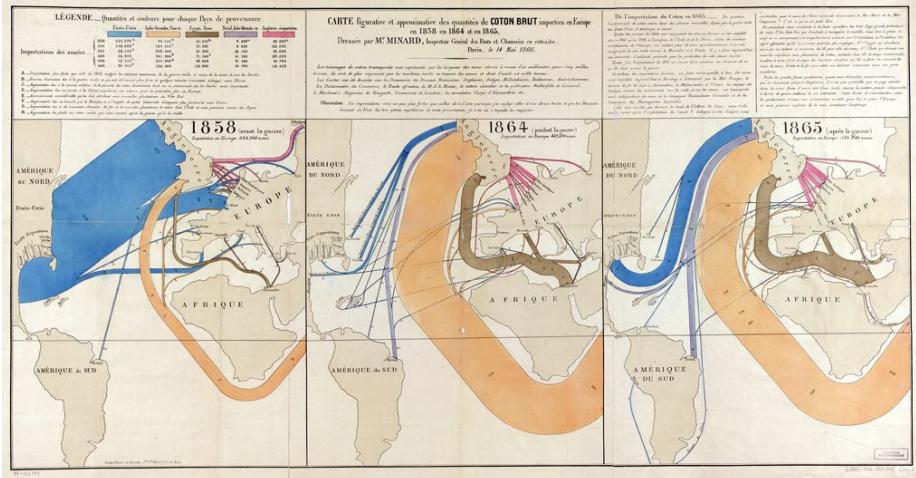
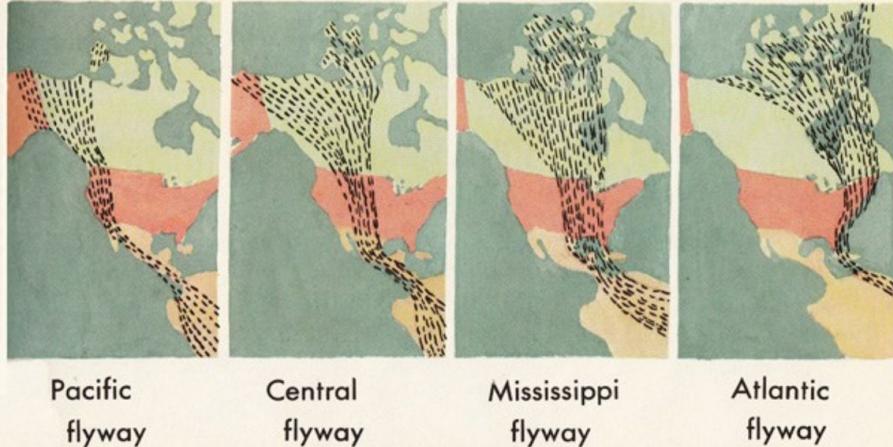
# Data Comics

## European Alliances before World War I (1836-1914)

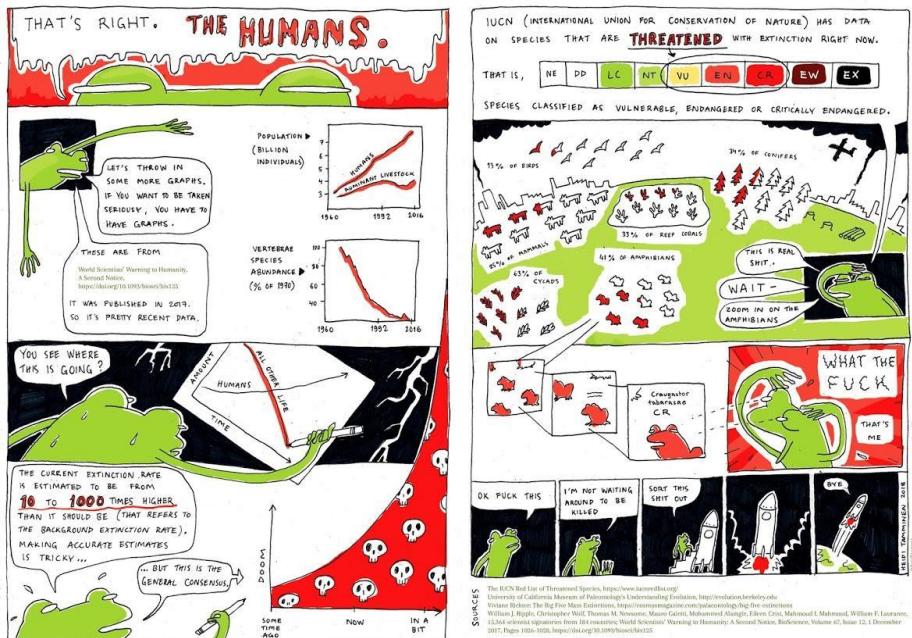
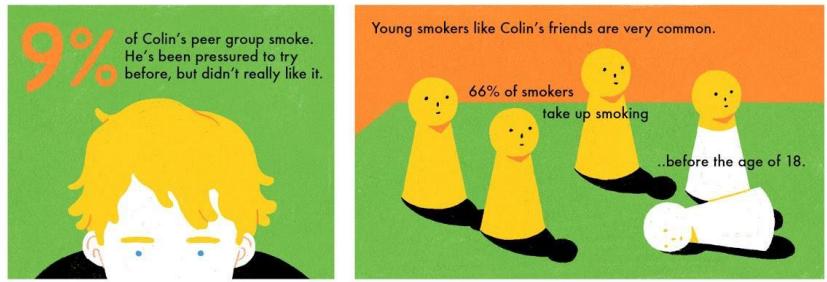
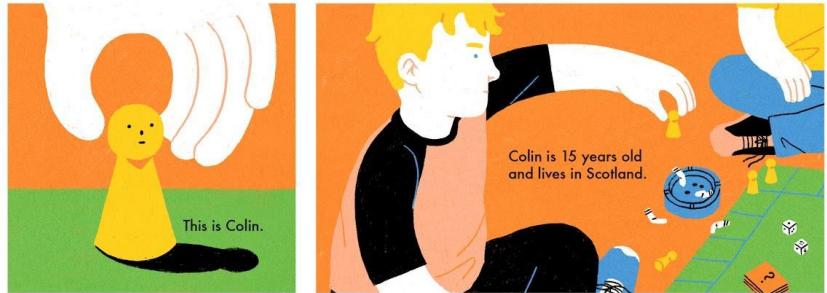


# Data Comics

Maps can show the way birds go when they fly north or south for the season.

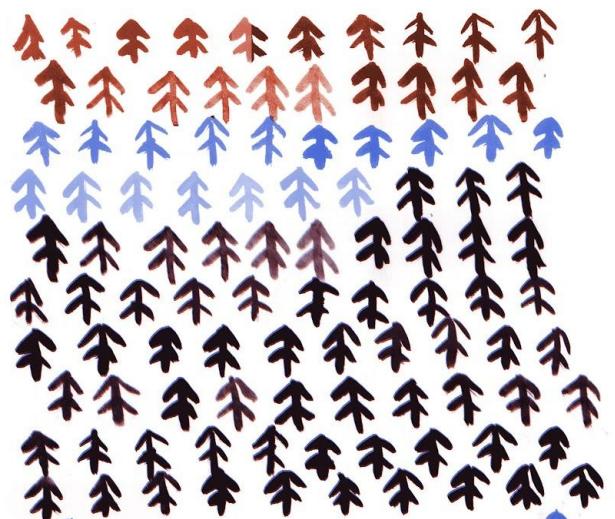


# Data Comics



TREES STORE  
UP TO  
300 MILLION TONNES  
OF CARBON

300 MILLION TONNES



20% OF THE AMAZON  
RAINFOREST HAS  
ALREADY BEEN  
DEFORESTED, WHILE  
17% HAS BEEN  
LOST DUE TO  
CATTLE FARMING

15%  
OF THE WORLD'S GREENHOUSE  
GAS EMISSIONS ARE A  
RESULT OF DEFORESTATION



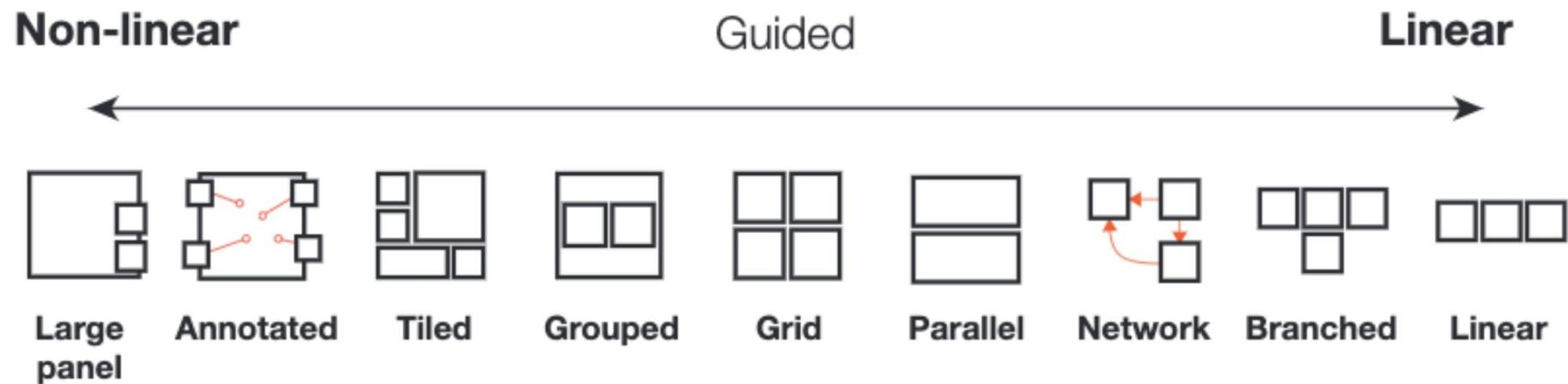
BUT WHAT ELSE  
CONTRIBUTES TO  
THIS MASS REDUCTION?



HOWEVER, ALL IN ALL, 18 MILLION ACRES  
ARE LOST PER YEAR



# Data Comics Design Patterns



Bach, Benjamin, et al. "Design patterns for data comics." *Proceedings of the 2018 chi conference on human factors in computing systems*. 2018.

# Data Comics Design Patterns

## Narrative



Exposé



Multiple-explanations

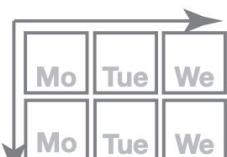


Question & answer

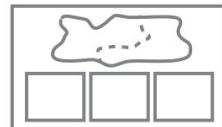
## Temporal



Temporal sequence

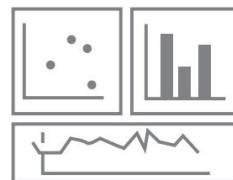


Time-grid



Time-nesting

## Faceting



Multiple facets



Contrast

## Visual Encoding



Build-up



Legend

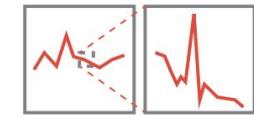


Annotated transition

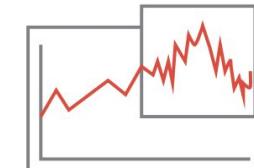
## Granular



Zoom



Cut-out



Lens

# Data Comics Design Patterns

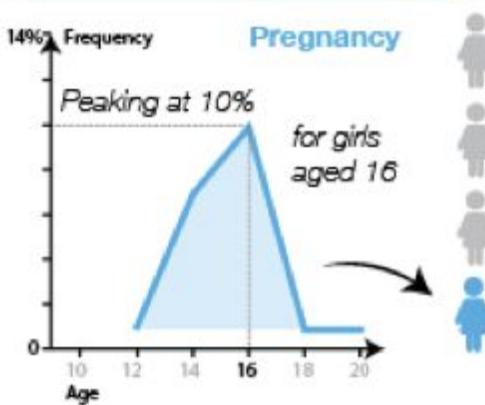
Zoom



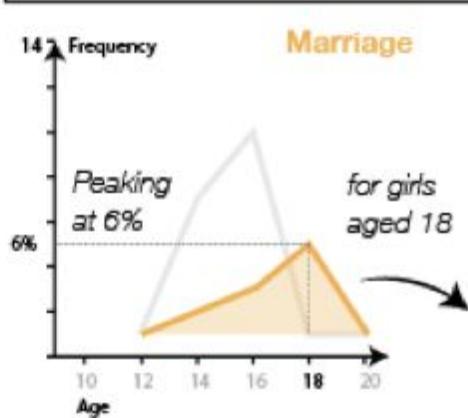
down from 127 in 2010

# Data Comics Design Patterns

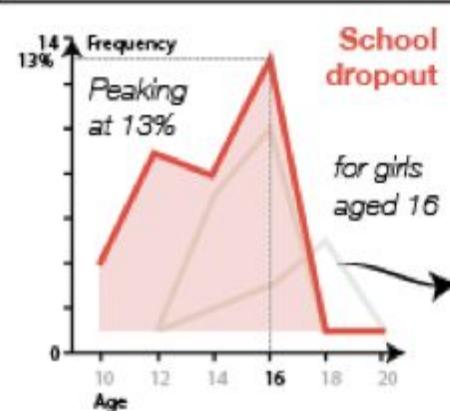
She has a one-in-four risk of becoming pregnant during adolescence,



is at high risk of being engaged in early marriage,

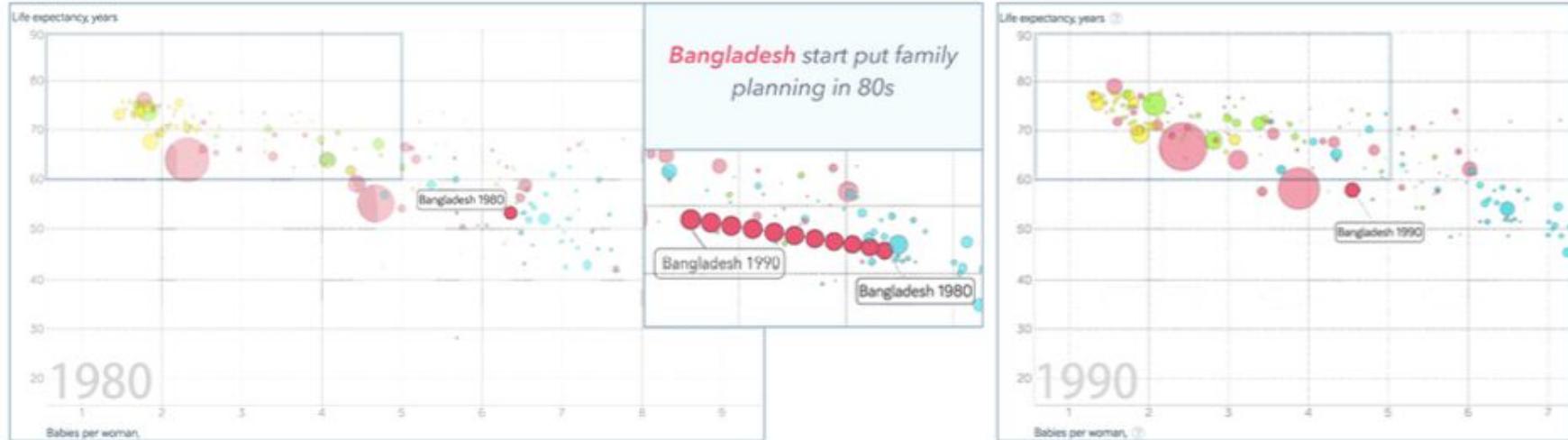


and will likely drop out of school before reaching secondary level.



# Data Comics Design Patterns

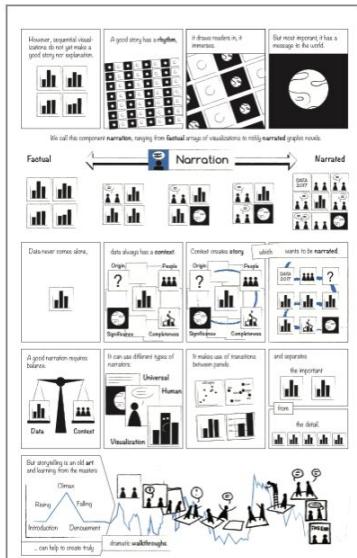
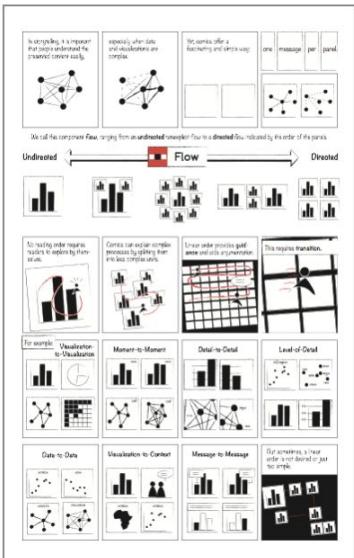
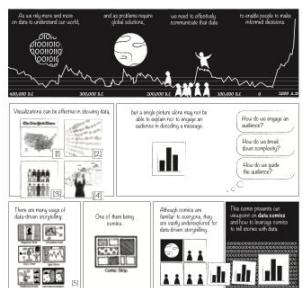
*Now let's look at the next decadea from 1980 - 1990*



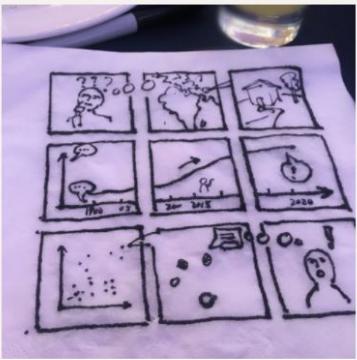


## The Emerging Genre of Data Comics

Benjamin Bach, Harvard University  
Nathalie Henry-Riche, Microsoft Research  
Sheila Ghosh, University of Calgary  
Hanspeter Pfister, Harvard University



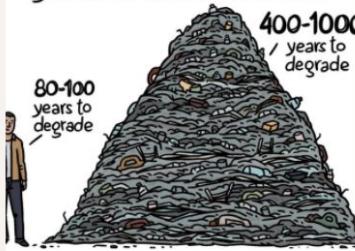
Bach, Benjamin, et al. "The emerging genre of data comics." *IEEE computer graphics and applications* 37.3 (2017): 6-13.



## Napkin Comic

Zezhong Wang

The majority is accumulating in landfills and the environment at large, where it will outlive the next several generations of human civilization.

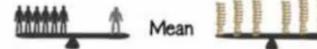


## United States of Plastic

The Guardian

The rich drive up the mean far above the typical income is. Therefore, statistician instead let the median represent the average.

While the mean is the mid-point that splits the total amount of income into equal halves.

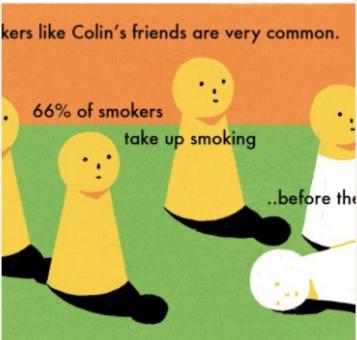


the median splits the population into equal halves, even though above-median people have a much higher income in total.



## Child Poverty

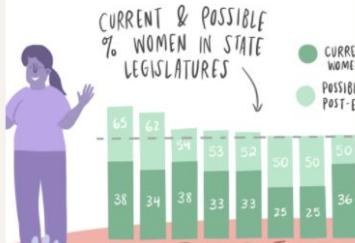
Lovisa Sundin



## Smoking

Terri Po

CORD NUMBERS OF WOMEN ARE WINNING FOR OFFICE... AND NO THEY'RE WINNING PRIMARIES.



## The Political Future is Female

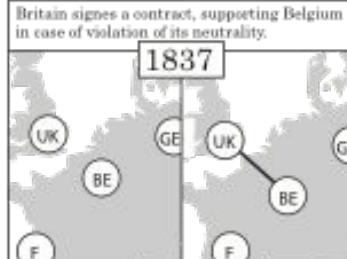
Olivia Walch - the NIB

China's rise is so significant because of its sheer enormity. If you were to talk to a random person on Earth, it's likely they speak Chinese.



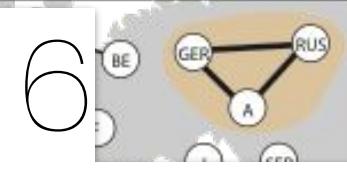
## The Future Sounds Chinese

Josh Kramer - The NIB

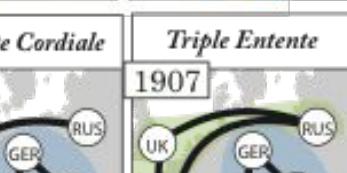
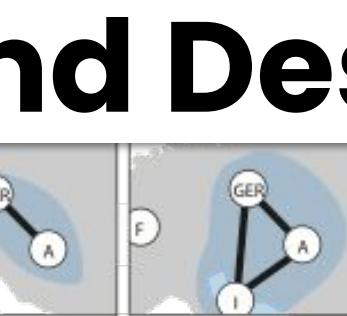
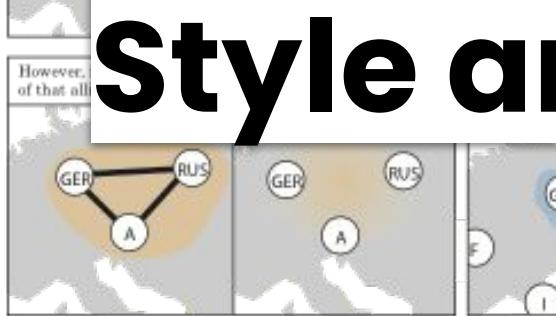


German chancellor Bismarck manages ally Germany, Austria and Russia in the Three Emperors' Alliance, ...

leaving France isolated against a well integrated Germany.



# Session 6

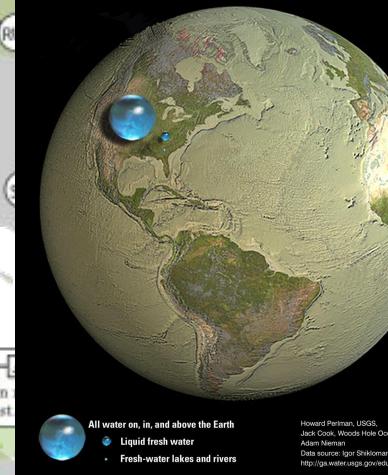


**1914**

July, 23rd ... Austria imposes ultimatum on Serbia.

July, 28th Rejection of the ultimatum leads to first open war.

German very fast



Online Course  
**Data Visualization  
for Professionals**



THE UNIVERSITY  
of EDINBURGH

**Benjamin Bach**

June 2022

<http://benjbach.me>  
<https://datavis-online.github.io>

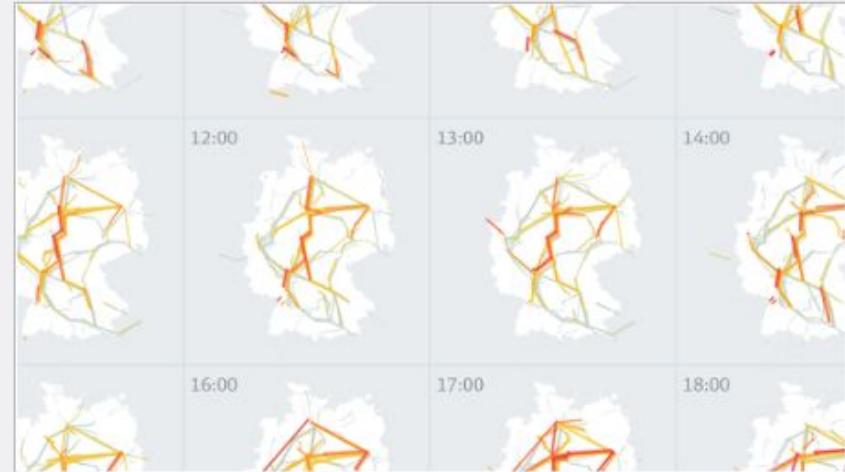
-- Not for external use --

# Moritz Stefaner

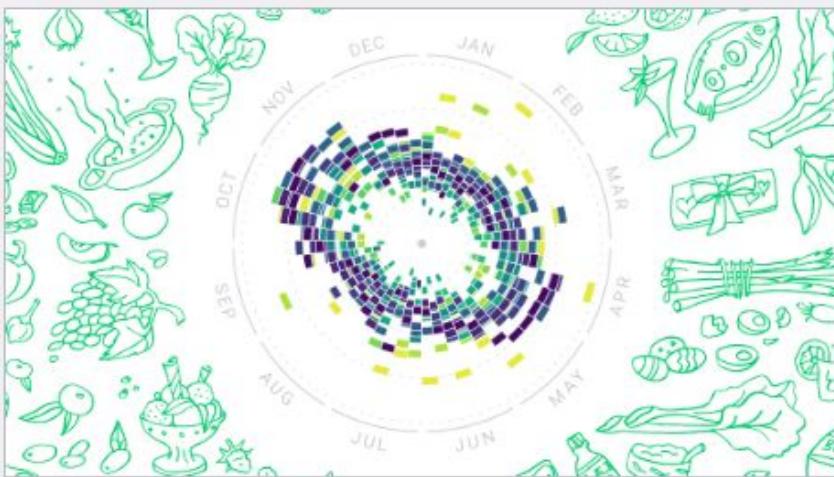
## Featured projects



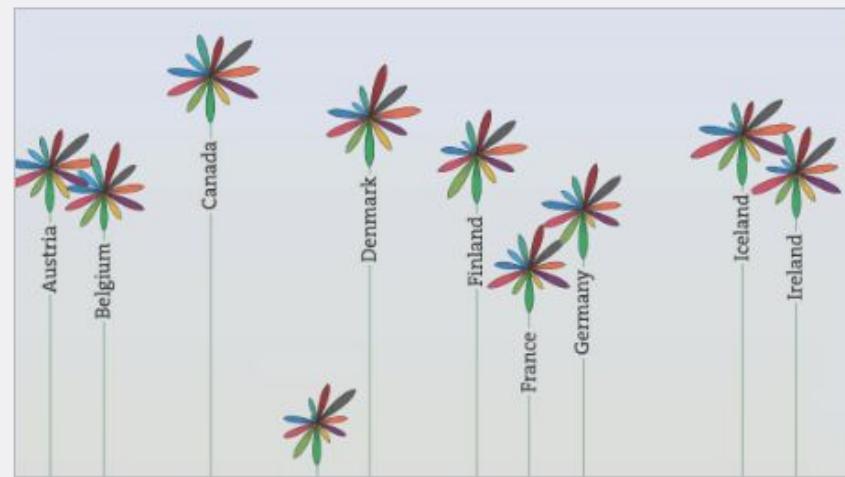
**Multiplicity** A collective photographic city portrait



**Peak Spotting** Data on rails

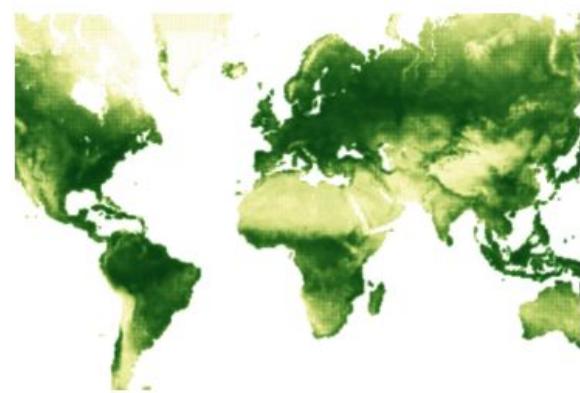
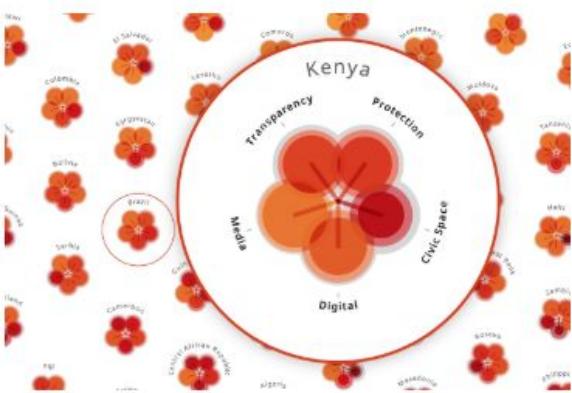
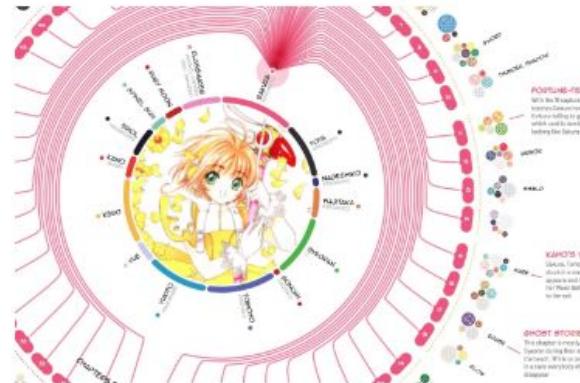
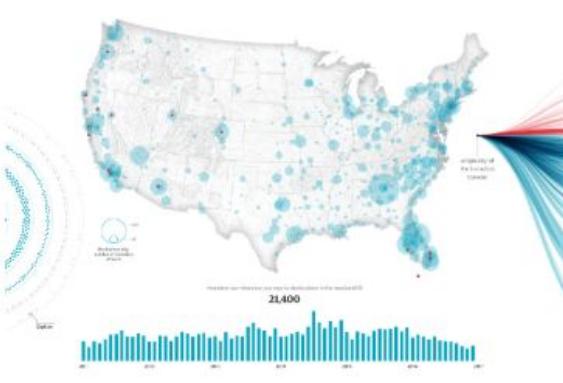
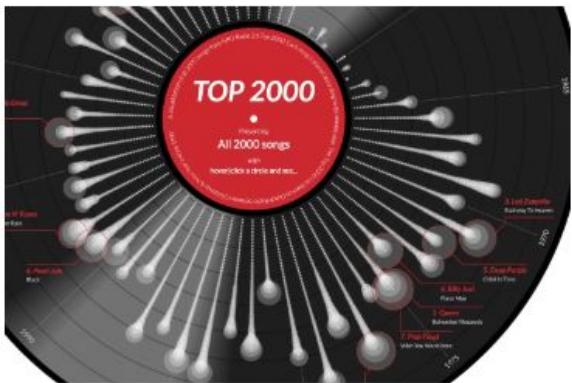
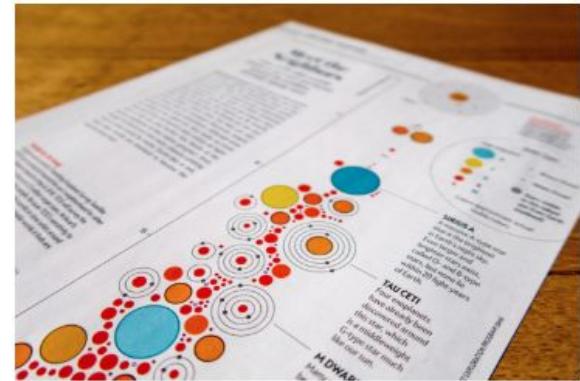
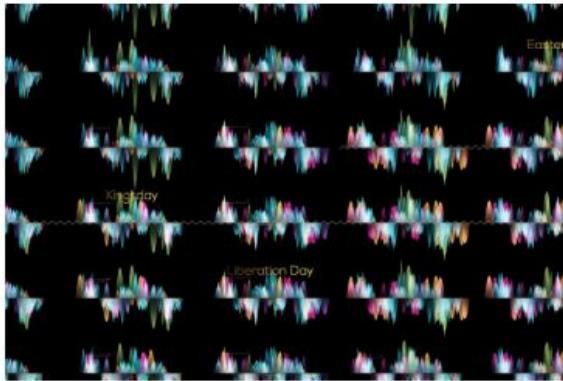


**The Rhythm of Food** Analyzing food seasonality

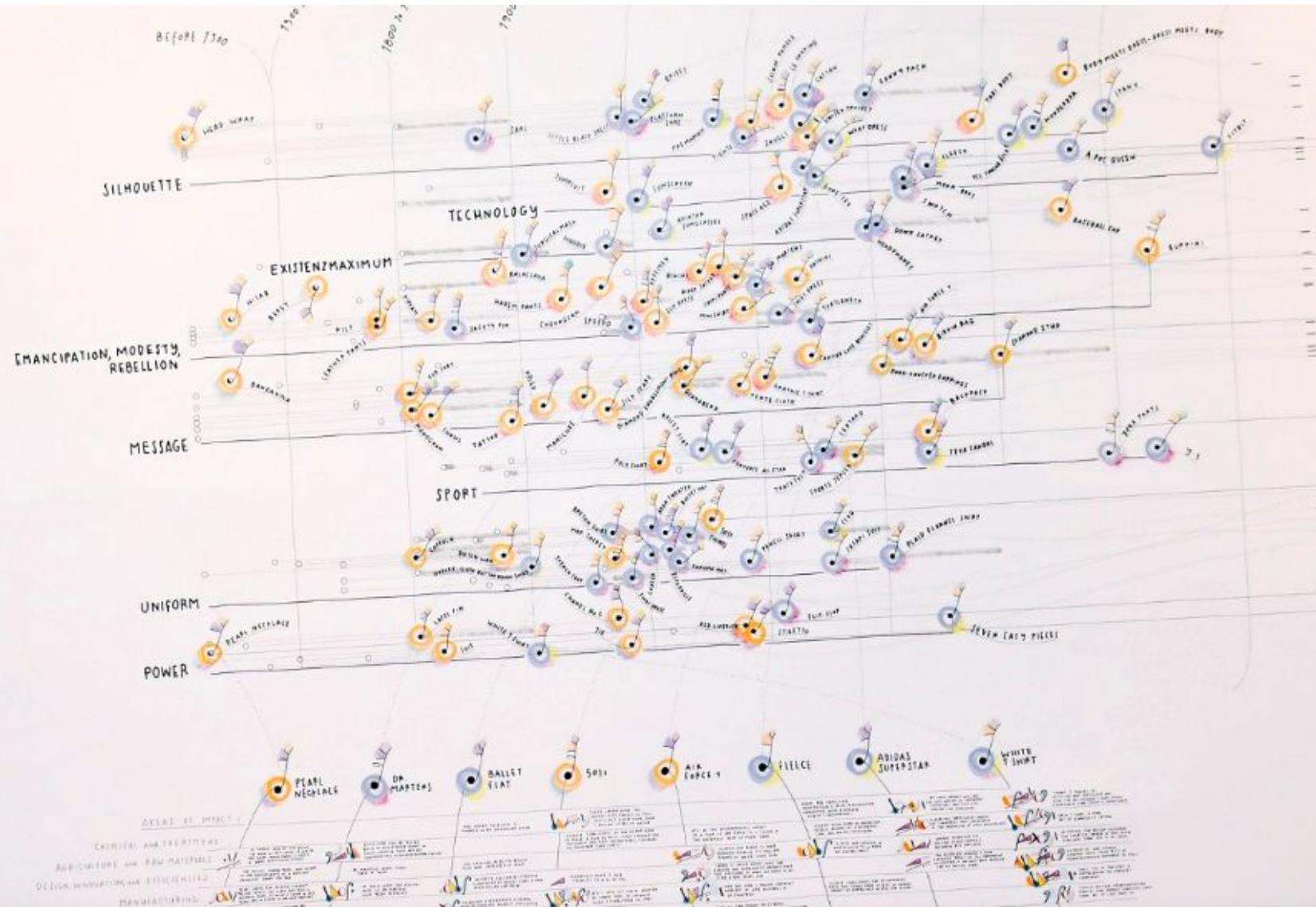


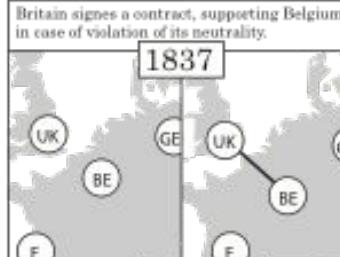
**OECD Better Life Index** How's life?

# Nadieh Bremer



# Georgia Lupi



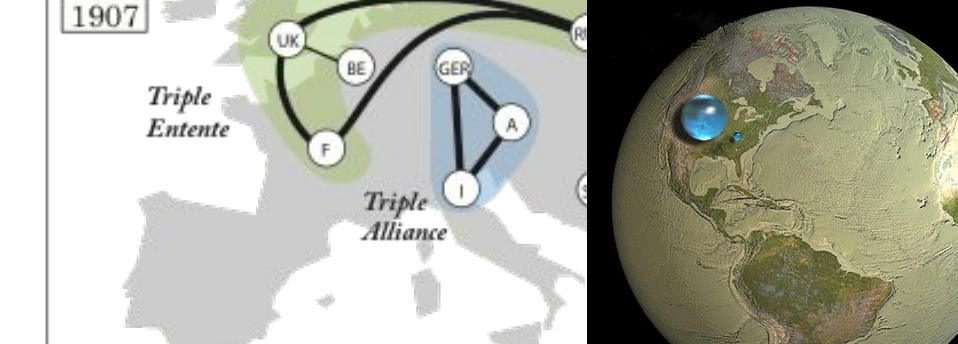
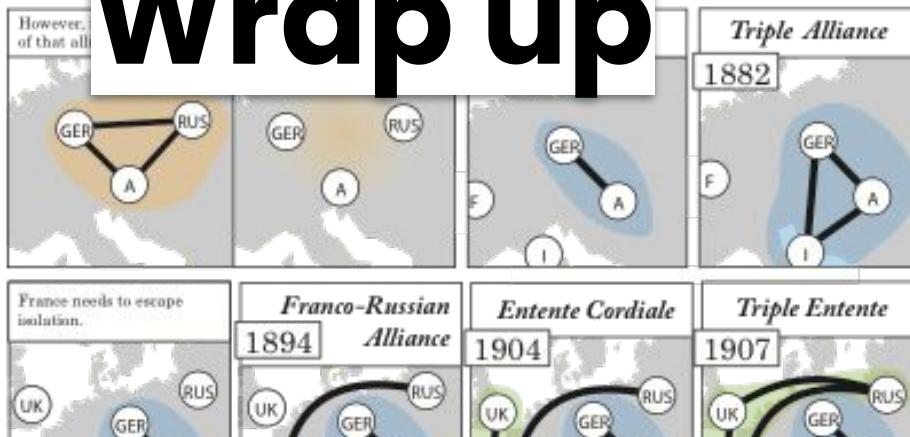


German chancellor Bismarck manages ally Germany, Austria and Russia in the Three Emperors' Alliance, --

leaving France isolated against a well integrated Germany.



# Session 6 Wrap up



All water on, in, and above the Earth  
Liquid fresh water  
Fresh-water lakes and rivers  
Howard Perlman, USGS  
Jack Cook, Woods Hole Oceanographic Institution  
Adam Nieman  
Data source: Igne Sklikovat  
<http://ga.water.usgs.gov/watertemp/>



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June 2022

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# Summary

- Storytelling for communication and engagement
- Form follows messages
- Story structures to create stories
- Know your audience
- Choose your storytelling genre

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# Book recommendations

