

Slaying the Data Dragon

AASL 2013: 11/16/2013, 8:00 – 9:15AM

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Resources for Math and Visual Literacy here:

<http://www.noodletools.com/debbie/literacies/>

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@activelearning

Slides: <http://bit.ly/fontblog>



**Today is about big data as
an emerging, important
kind of resource for
librarians and learners.**

(It's not about how to use student test data. But that's part of the big data story, just not the focus of our talk.)

"MS-DOS Blue Horizontal" by Kjetil Korslien on Flickr. CC-BY-NC. <http://flickr.com/photos/kjetikor/8484119632/>

How We Came
to Care
About Big Data





Cheaper by the Dozen

Schenke, Jim. *June 16, 2006* *Clips from Real-life Cheaper by the Dozen Parents Preserved, Released. Purdue University.*

Purdue U, 16 June 2006. Web. 21 Oct. 2013.

<<http://www.purdue.edu/uns/html4ever/2006/060616.Gilbreth.film.html>>.

DOUBTS ABOUT DATA

The Wright brothers had designed two gliders using the accepted lift and drag equations, Otto Lilienthal's aerodynamic data, and Smeaton's coefficient. Neither glider produced the lift those calculations predicted. Wilbur and Orville felt it was time to perform their own aerodynamic research.

The Wrights examined all the terms in the lift and drag equations. Some values—weight of the craft, wind speed, and wing surface area—could be directly measured, so the Wrights were confident of their accuracy. But the coefficients of lift and drag and Smeaton's coefficient were drawn from the work of others. The brothers focused on these as the possible source of their gliders' poor lift performance.

The Wrights' Bicycle Apparatus

In the fall of 1901, the Wrights began to test the accuracy of the equations they had been using. Tapping their familiarity with bicycles, they created a device to compare the forces acting on two objects with different shapes.

This is how it worked:

- They mounted a free-spinning bicycle wheel horizontally on the front fork of a bicycle.
- To the wheel they attached two objects, as shown here: a flat plate (left) and a model wing (right) patterned after Lilienthal's.
- When they rode the bicycle, the air flowing past the two objects caused the wheel to rotate into an equilibrium position that depended on whose the forces on the two objects balanced.

Then, data recording and calculations:

- They recorded the angle of the wing to the airflow at which the air pressure on the wing shape balanced the air pressure on the plate. This is called the angle of attack.
- Then they compared what Lilienthal's data indicated the angle should have been.

The Results

The model wing required more than three times the angle of attack than Lilienthal's data predicted. The Wrights concluded that either Lilienthal's data or Smeaton's coefficient—or both—were in error.



Courtesy of The Henry Ford, Dearborn, MI

Understand what the numbers mean...

Study size: Sample size of 10 (N=10)

Results: Objective scoring by blinded investigators indicated that the treatment resulted in improvement in all (100%) of the students. Of students showing overall improvement, 78% were graded as having either excellent or moderate achievement.

What is Big Data? – Kristin’s Take

- Mechanical repositories of data
- Huge in scope – more than humans could process
- Computers ingest a lot; then mechanically look for correlations
- Unearths correlations that are useful, even if you don’t know why they are useful
- Cannot evaluate “good” vs. “bad”
- Might turn up connections without explanations (we can hypothesize)

What is Big Data? – Debbie's Take

- **Technology** (built by ...?...) ingests vast amounts of data (not a sampling of data)
- **Measure** what was not measured before (but messy)
- **Correlations**, not causations (you figure “why”)
- **Drives decision-making** (vs. experience, intuition)
- “Extract new insights or create new forms of value in ways that **change** markets, organizations and the relationship between citizens and governments, and more” (6).

Tradeoffs: Both have biases

Random (clean) vs. Comprehensive (messy)

- Random samples: “**Systematic biases** in the way the data is collected can lead to the extrapolated results being very wrong” (23).
- Suck in as much as feasible (28) a “fishing expedition” (29), “collected passively” (30) and calculate to account for **messy** (40) but correlation increases likelihood of **errors** (33) and maybe you **missed** important sources of data
 - So iterative gathering, e.g., Google translate (39)

Big data is growing (in 2013)

- Stored information in the world is currently estimated to be around **1200 exabytes**
- Less than 2% (60 billion gigabytes) is non-digital
- NSA's Utah facility could hold up to **12 exabytes**

Mayer-Schönberger, Viktor, and Kenneth Cukier. *Big Data: A Revolution That Will Transform How We Live, Work, and Think*. Boston: Houghton, 2013. Print.

Hill, Kashmir. "Blueprints of NSA's Ridiculously Expensive Data Center in Utah Suggest It Holds Less Info than Thought." *Tech. Forbes*, 24 July 2013. Web. 18 Nov. 2013.

<<http://www.forbes.com/sites/kashmirhill/2013/07/24/blueprints-of-nsa-data-center-in-utah-suggest-its-storage-capacity-is-less-impressive-than-thought/>>.

acxiom

How to cite in 3

1. Select your source
2. We'll automatically
3. Repeat to build yo

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AppNexus
Atlas
Beanstock Media
BlueKai
Criteo
Datalogix
DoubleClick
DoubleVerify
Dynamic Logic
Evidon Notice
eXelate
Facebook Exchange (FBX)
Glam Media
Google AdSense
Google AdWords Conversion
Google Analytics
Integral Ad Science
KissInsights
Lotame
MediaMath
MediaMind
Moat
myThings
NetRatings SiteCensus
Neustar AdAdvisor
New Relic
Quantcast
Rocket Fuel
ScoreCard Research Beacon
Skinected
Turn
Twitter Badge
Twitter Button
Undertone Networks
VoiceFive

The image shows a screenshot of a ZDNet article titled "Want to know who's spying on you online? There's an app for that". The article is by Nick Heath, dated October 25, 2013. It discusses Mozilla's release of a tool to track trackers. A large list of tracking companies is overlaid on the right side of the page. Below the article, there is a bar chart showing the amount of data wasted every year, with a stack of \$25 billion bills and a label "YEAR".

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MUST READ: *Mavericks: The end of Macs in the enterprise?*

Topic: Software Discover Follow via: RSS Email

Want to know who's spying on you online? There's an app for that

Summary: Mozilla has released a tool that will allow users of the Firefox browser to know which companies are tracking them online.

By Nick Heath | October 25, 2013 -- 12:17 GMT (05:17 PDT)
Follow @NickJHeath

Comments 17 Votes 2 Like 126 Tweet 91

Share more +

Would you like to know who's watching which websites you visit? Well there's an app for that.

It's standard practice for advertisers to keep tabs on the sites you frequent using tracking cookies. Tracking cookies are small text files that are downloaded on to your computer that log the websites you browse and, in some case, how you interact with these sites. Advertisers and other companies use these logs to build a profile of your interests, allowing advertisers to sell you products and

Adobe Tag Container
AdRoll
Amazon Associates
BlueKai
BrightRoll
ClickTale
Crowd Science
DoubleClick
Evidon Notice
Facebook Connect
Facebook Social Plugins
Google AdSense
Gravatar
Integral Ad Science
LinkedIn Widgets
Media Optimizer (Adobe)
NetRatings SiteCensus
nRelate
Omnitree (Adobe Analytics)
ScoreCard Research Beacon
TRUSTe Notice
Turn
Twitter Badge
Twitter Button

Every year \$25 BILLION is wasted on the management and upkeep of underutilized servers.

\$50 BILLION

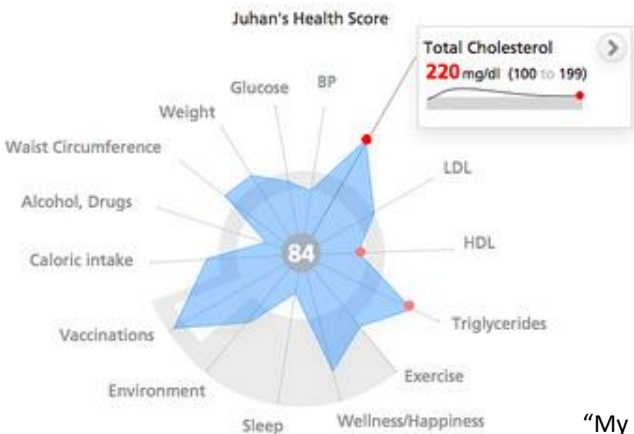
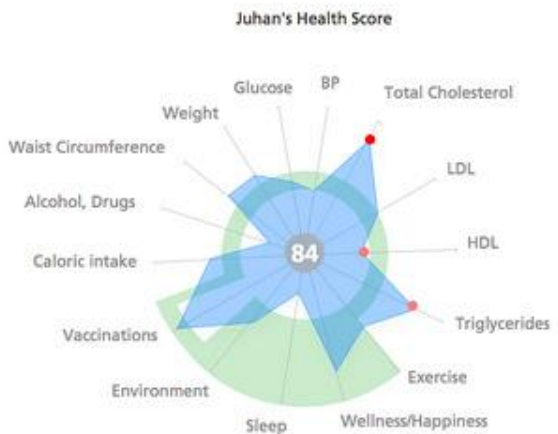
YEAR \$25 BILLION

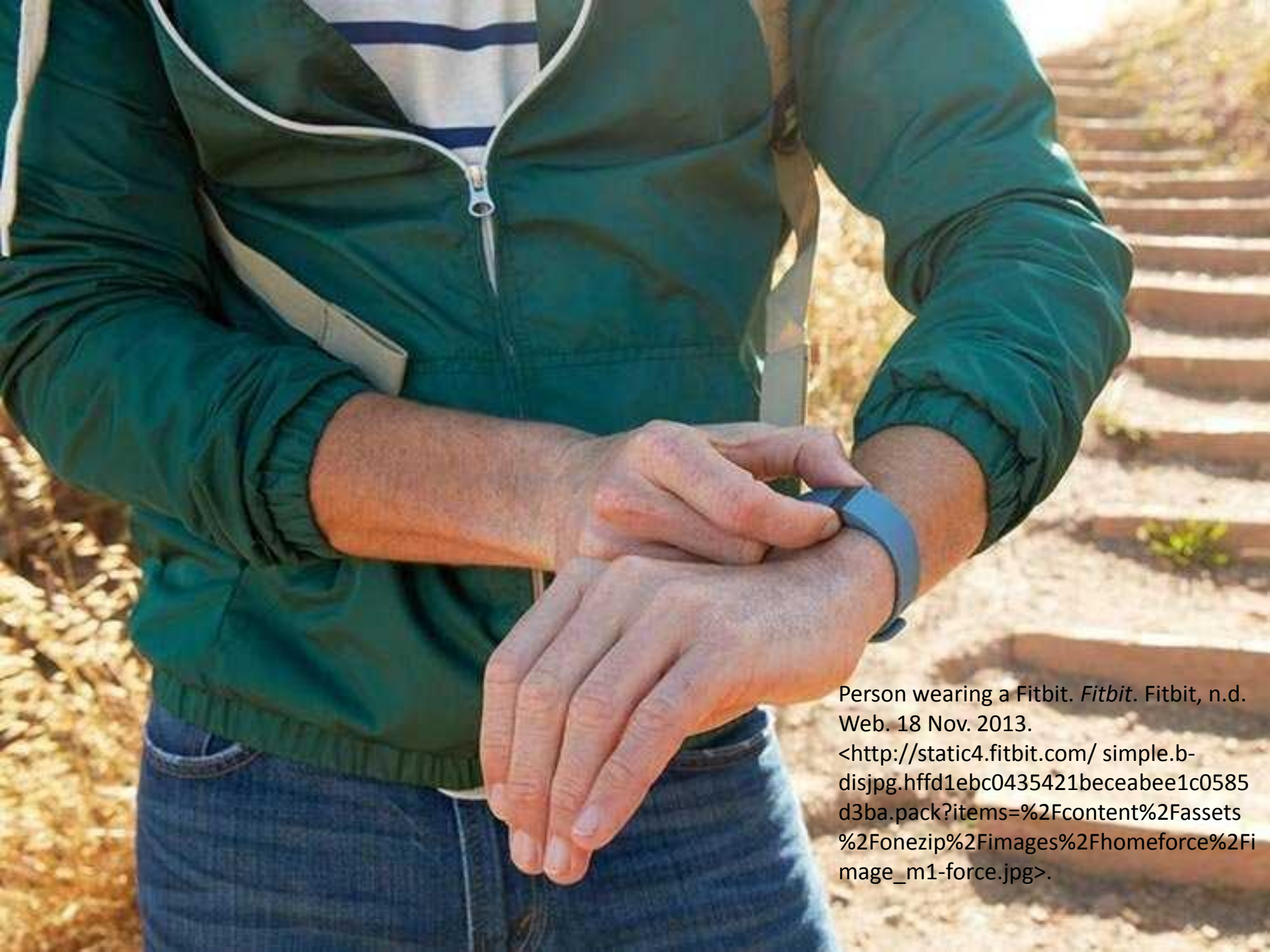
"Online Privacy and Rights of Students: Our Commitment to You." *Noodling*. NoodleTools, 1 Oct. 2013. Web. 21 Oct. 2013. <<http://www.noodletools.com/>

Quantified Self: Personal Data Aggregators

HRECORD
HEALTHSCORE SPIDER IDEAS V4
VISUAL TARGETS

JUHAN SONIN
27.MAY.10





Person wearing a Fitbit. *Fitbit*. Fitbit, n.d. Web. 18 Nov. 2013.
<http://static4.fitbit.com/simple.b-disjpg.hffd1ebc0435421beceabee1c0585d3ba.pack?items=%2Fcontent%2Fassets%2Fonezip%2Fimages%2Fhomeforce%2Fimage_m1-force.jpg>.

2010 Census Data

Citizen Survey Results

Geographic Information

Finance

Library

Community Services

Public Works

Development Center Permits

Utilities - Gas

Utilities - Electric

Utilities - Water

Utilities - Wastewater

Geographic Information

Source: IT Enterprise System - GIS

URL: <http://bit.ly/LZ2ci>

4

2

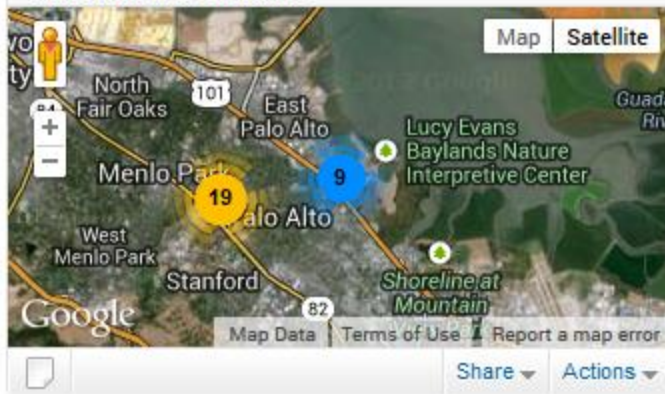
0

Tweet

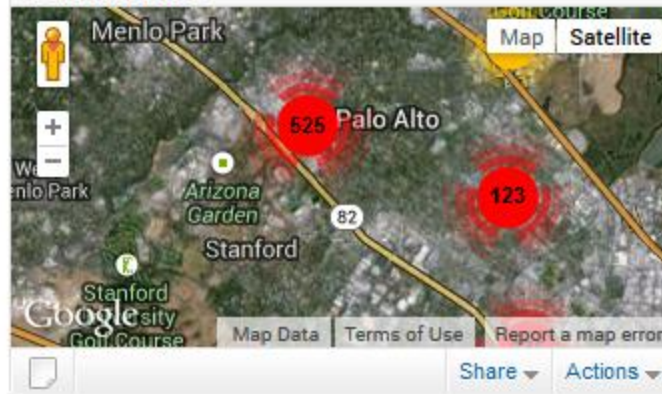
Like

+1

Palo Alto Park Locations



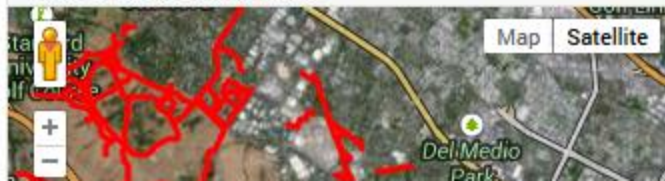
Palo Alto Trees



Palo Alto Pavement



Palo Alto Paths and Trails



Palo Alto Zoning





"I have a bad feeling about this" by Rob Iretton on Flickr. CC-BY-NC-SA
<http://flickr.com/photos/aoisakana/3224021222/>

Predictive Modeling

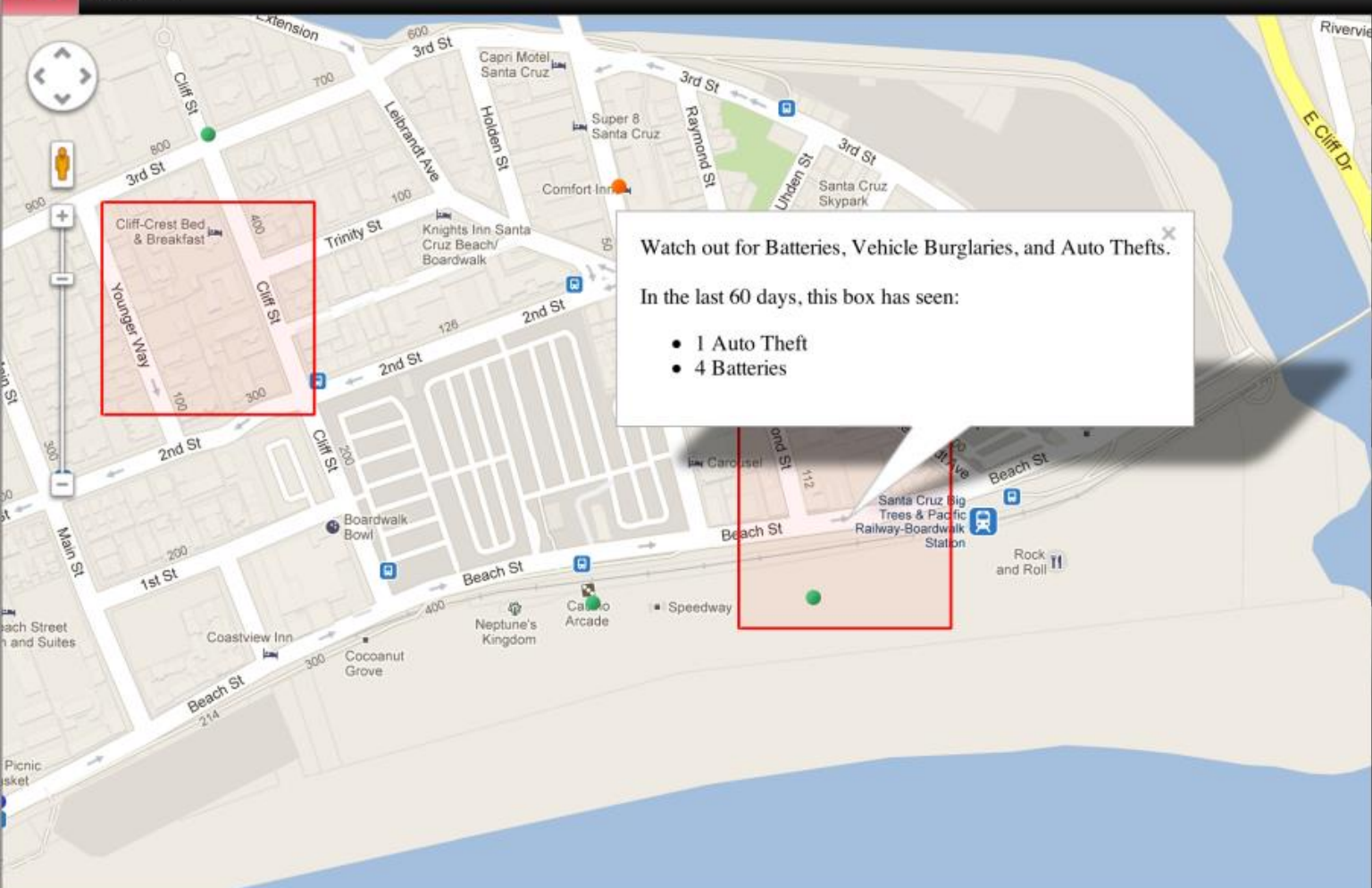
A statistical model
of future behavior



Hill, Jonah, perf. *Moneyball*. Columbia, 2011. Film.



Spielberg, Steven, dir. *Minority Report*. 20th Century Fox & Dreamworks, 2002 .Film.



Watch out for Batteries, Vehicle Burglaries, and Auto Thefts.

In the last 60 days, this box has seen:

- 1 Auto Theft
- 4 Batteries

Crime Types

- Vehicle Burglary
- Burglary
- Auto Theft
- DW Assault
- Battery
- Gang Activity

Crime History

Last 28 days

Example: Target Can Predict Pregnancy



Kashmir Hill
Forbes Staff

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Welcome to *The Not-So Private Parts where technology & privacy collide* [full bio](#) →



TECH 2/16/2012 @ 11:02AM | 2,219,161 views

How Target Figured Out A Teen Girl Was Pregnant Before Her Father Did

325 comments, 170 called-out + Comment Now + Follow Comments

Every time you go shopping, you share intimate details about your consumption patterns with retailers. And many of those retailers are studying those details to figure out what you like, what you need, and which coupons are most likely to make you happy. [Target](#), for example, has figured out how to data-mine its way into your womb, to figure out whether you have a baby on the way long before you need to start buying diapers.

Charles Duhigg outlines in the [New York Times](#) how Target tries to hook parents-to-be at that crucial moment before they turn into rampant — and loyal — buyers of all things pastel, plastic, and miniature. He talked to Target statistician Andrew Pole — before Target freaked out and cut off all communications — about the clues to a customer's impending bundle of joy.

▲ CONFERENCES AND MORE



Share

Algorithmic Regulation

“...solve public problems without having to explain or justify themselves to citizens...with a perfect, highly personalized, irresistible nudge”

Morozov, Evgeny. "The Real Privacy Problem." *MIT Technology Review* Nov.-Dec. 2013: n. pag. *MIT Technology Review*. Web. 18 Nov. 2013.
<<http://www.technologyreview.com/featuredstory/520426/>

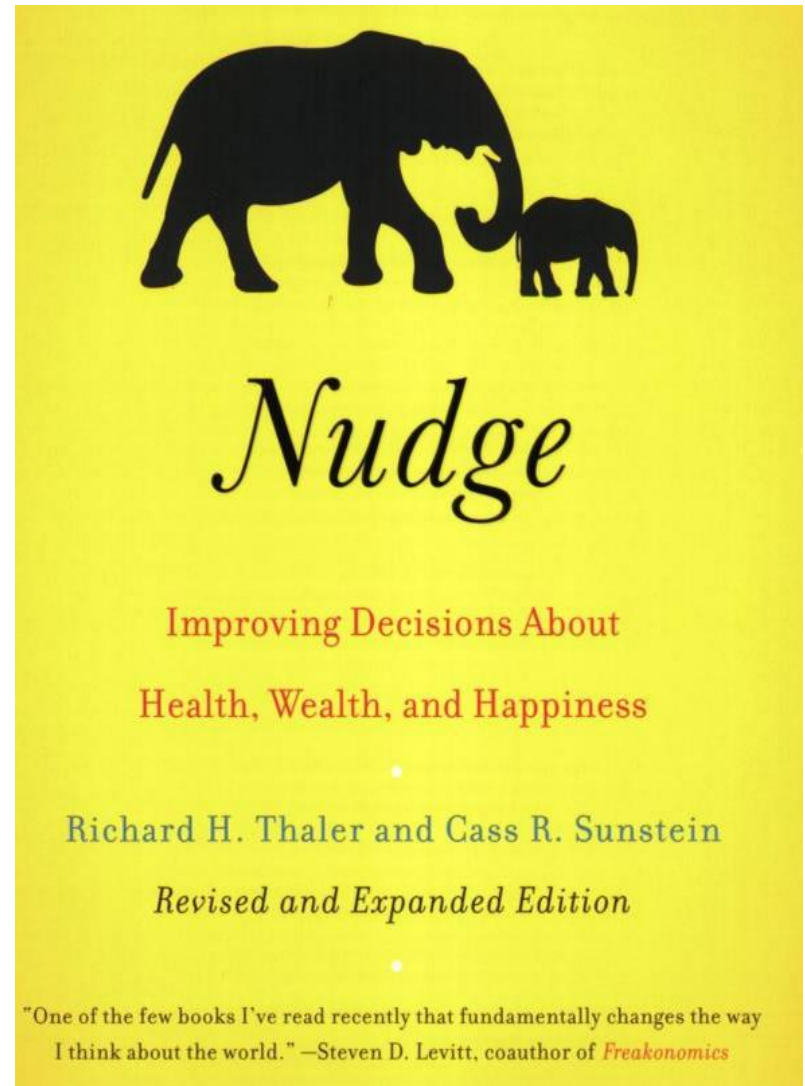
the real privacy problem/>

“Nudge”

Bad, evil, paternalistic...or good?



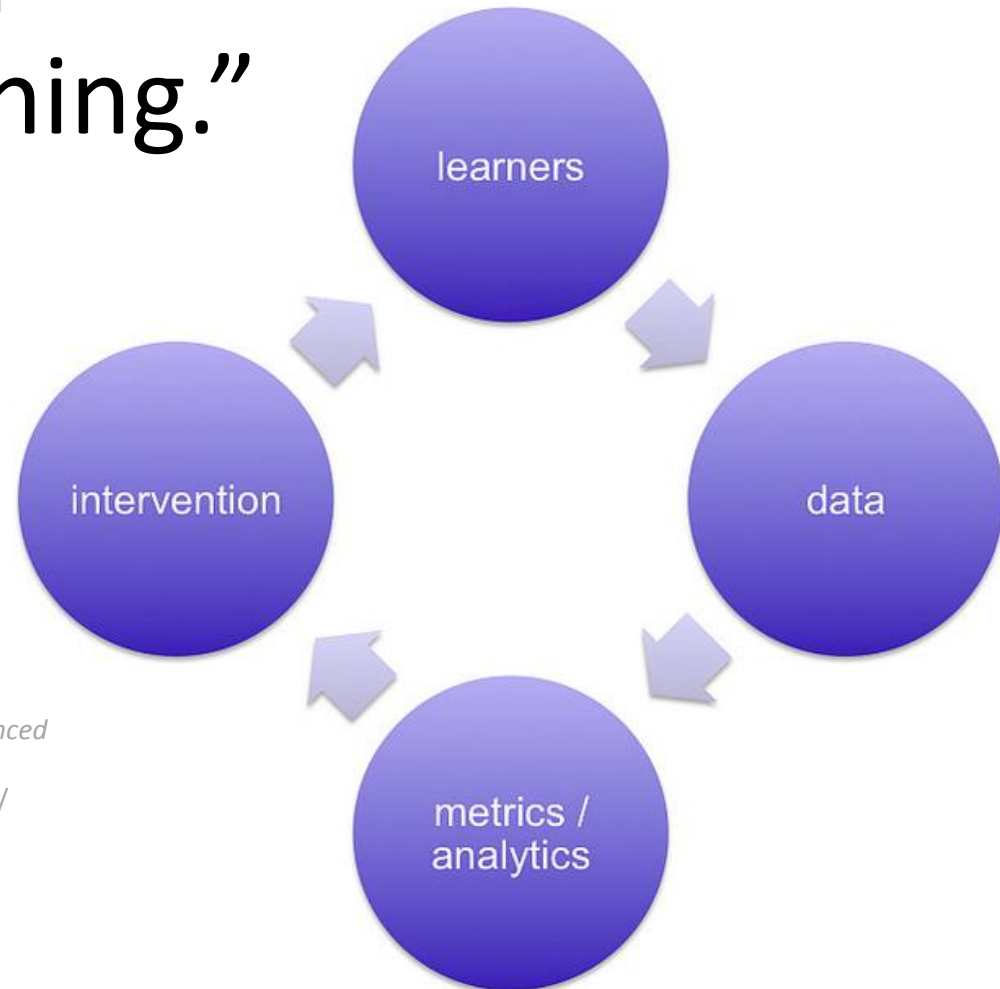
Suzuki, Miwa. "Japan 'Diet Glasses' Fool Wearers into Eating Less." *Google*. Google, 4 June 2012. Web. 18 Nov. 2013.
<<http://www.google.com/hostednews/afp/article/ALeqM5hWiomAbvJKjULCAP5c0wJwBk9TpQ?docId=CNG.2ef7d92f5a6586fb67dc4c456ff94dae.4b1>>.



"One of the few books I've read recently that fundamentally changes the way I think about the world." —Steven D. Levitt, coauthor of *Freakonomics*

Learning Analytics

“The collection, analysis and use of data patterns to optimize conditions for improving learning.”



Graduate School of Education. *Learning Analytics and Technology Enhanced Assessment (TEA)*. Discussion Paper no. 4. University of Bristol. U of Bristol, 2012. Web. 18 Nov. 2013. <<http://www.bris.ac.uk/education/research/sites/tea/publications/learninganalytics.pdf>>.”

The Learning Analytics Cycle” by Doug Clow on Flickr. CC-BY.
<http://flickr.com/photos/dougclow/5484184568/>

A young child with light brown hair, wearing a blue life vest and dark shorts with orange stripes, is climbing a metal ladder on a wooden dock. The child is barefoot and looking down at the water. The dock is made of weathered wooden planks. To the left, there is a white building with horizontal siding and a bright yellow object. In the background, there is a large body of blue water, a rocky shoreline with evergreen trees, and a clear blue sky.

Dipping Your Toe in Big Data

- How can your students take advantage of Big Data?
- What Big Data repositories can they access for research?
- How can students participate in as contributors in Big Data projects?

[Google.org home](#)

[Dengue Trends](#)

Flu Trends

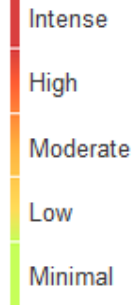
Home

Select country/region

[How does this work?](#)

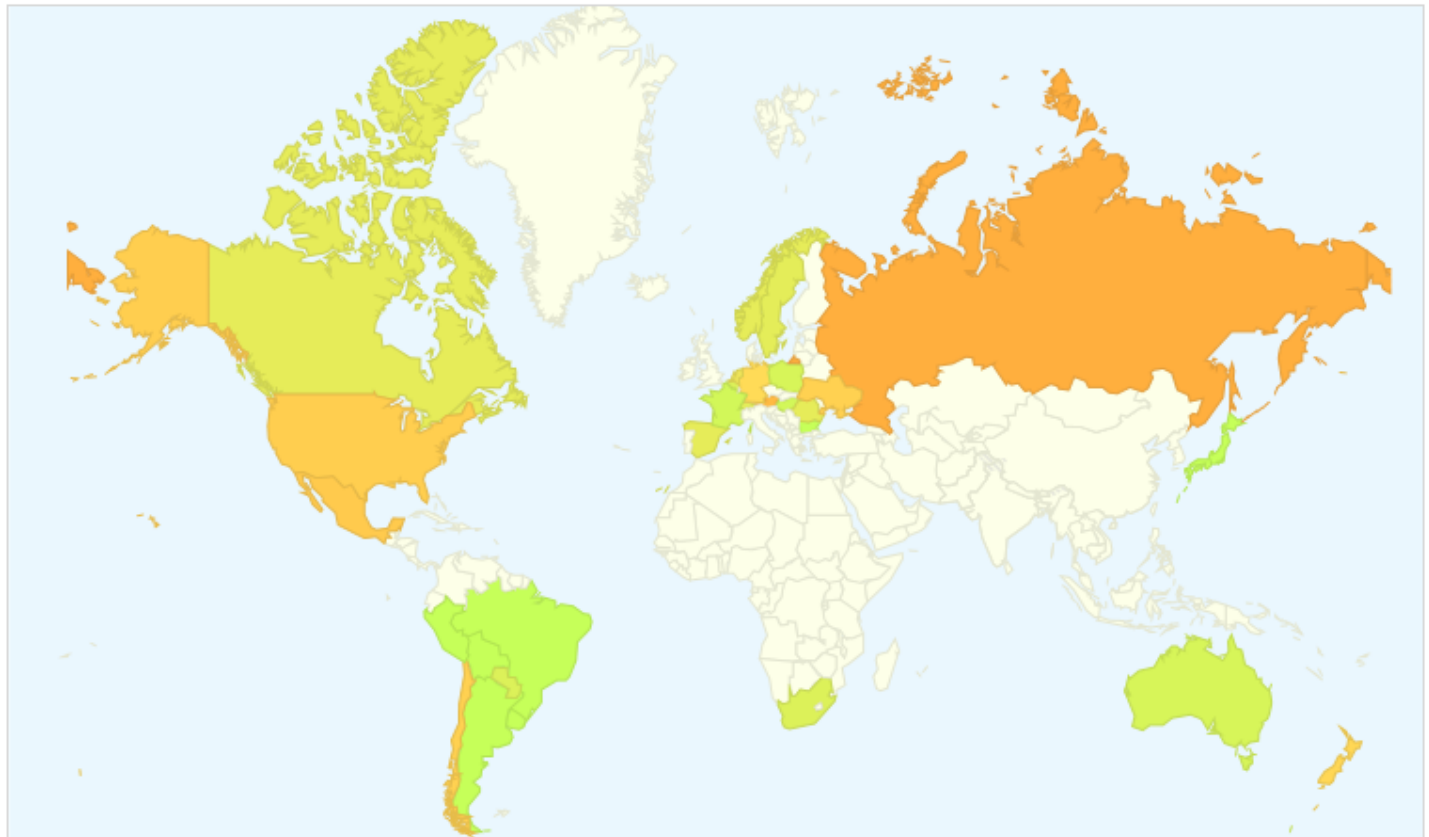
[FAQ](#)

Flu activity



Explore flu trends around the world

We've found that certain search terms are good indicators of flu activity. Google Flu Trends uses aggregated Google search data to estimate flu activity. [Learn more »](#)



[Download world flu activity data](#) - [Animated flu trends for Google Earth](#) - [Compare flu trends across regions in Public Data Explorer](#)

BUT Software algorithms may fail when human behavior changes



Global

Local

News

About Projects Mobile Donate Feedback English

Search disease or location

GO Advanced Search

Display Options: [Map] [Satellite]



Activity Index: Low (yellow), High (red). Country level (large pin), Province or local level (small pin).

Alerts from past week

Avian Influenza H7N9

Coronavirus Surveillance

1430 Alerts Now Showing

Date: 29 Mar 2013 - 6 Apr 2013 | Diseases: all | Places: all | Sources: all | Categories: all

Source	Date	Summary	Disease	Location	Species	Cases	Deaths	Significance
	5 Apr 2013	Beijing temporarily enhance the epidemic prevention and control level ...	Avian Influenza H7N9	Beijing, China	Humans			★★★★☆ 1 vote
	5 Apr 2013	Beijing temporarily enhance the epidemic prevention and control level ...	Avian Influenza	Beijing, China	Humans			★★★★☆ 1 vote
	5 Apr 2013	Hong Kong Hospital Authority experts in Shanghai about avian flu - ...	Avian Influenza	Hong Kong	Humans			★★★★☆ 1 vote
	5 Apr 2013	Hong Kong Hospital Authority experts in Shanghai about avian flu - ...	Avian Influenza	Shanghai, China	Humans			★★★★☆ 1 vote
	5 Apr 2013	Undersecretary of Health visited patient suspected of ... - The ...	Meningitis	Chile	Humans			★★★★☆ 1 vote

View all

Last update: 5 Apr 2013 02:00 | Next update: 5 Apr 2013 03:00

Socialexplorer.com: Historical census data visualized

 Social Explorer[®]
BETA

Maps & Tables

How To

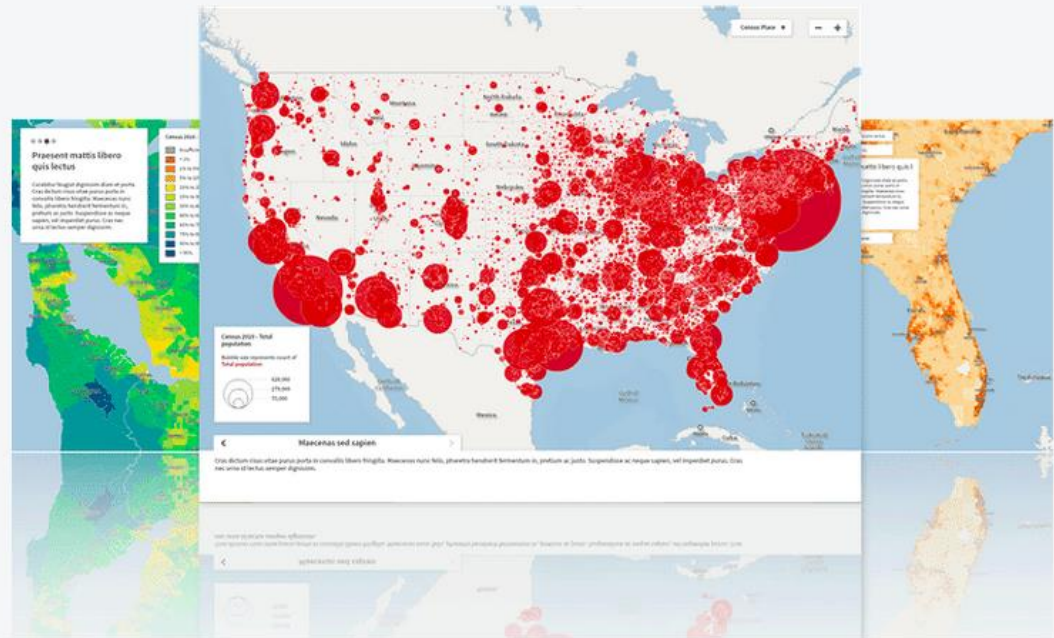
My Explorer

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Tell a Story with Data

Use our Interactive tools to easily create and share maps presentation and tables, or compare and analyse data using our resources to create stories and discover amazing facts.

[Take the Tour](#)



Opportunityindex.org



HOW OPPORTUNITY MEASURES UP IN YOUR COMMUNITY

★ About the Index

📄 Data & Scoring

🇺🇸 State Rankings

📈 National Trends

⚙️ Take Action

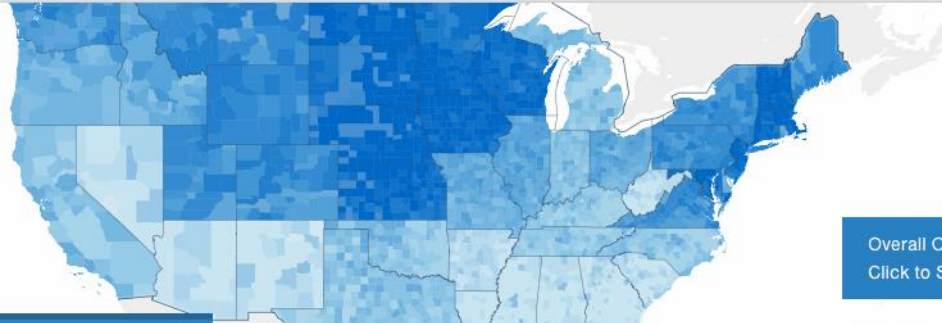
State View

County View



higher → lower

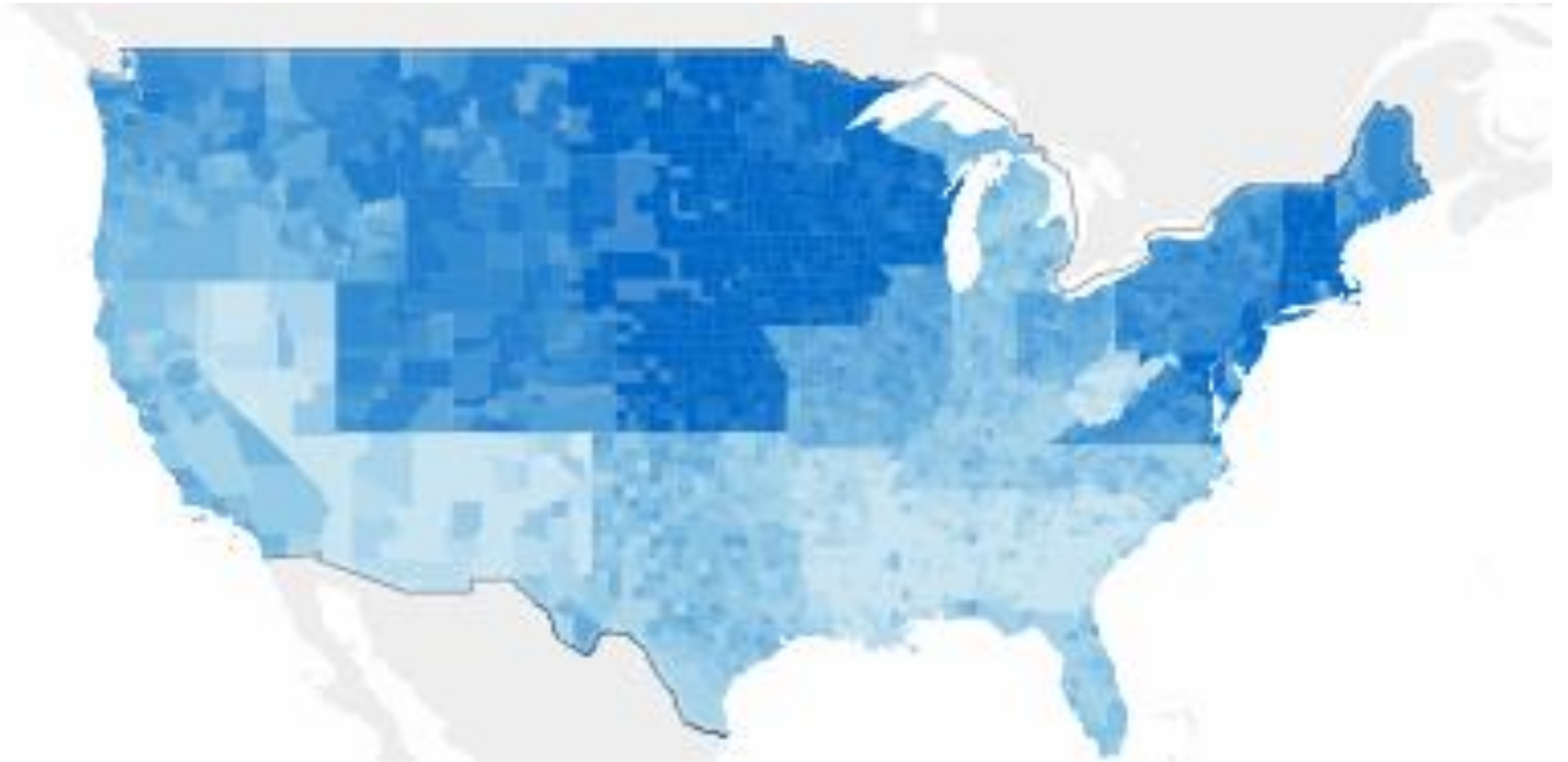
Search by city, state, county, or zip



Overall Opportunity
Click to Select A Different Indicator

	★ Opportunity Score	💰 Economy Score	📖 Education Score	👤 Community Score
Connecticut	56.9	56.0	54.8	59.9
National Average	50.9	49.4	49.3	54.1

Opportunityindex.org: Bigger Sample Size ... Bigger Picture



Royal Society of Chemistry: Vitamin C “Global Experiment”

The screenshot shows the 'LearnChemistry' website with the following content:

- LearnChemistry**
Enhancing learning and teaching
- Navigation menu: Resources, Wiki, Community, CPD, Higher Education, About, More
- Breadcrumbs: Learn Chemistry > Online Experimentation > Global Experiment > Global Experiment Chemistry Week
- Section: Online Experimentation
- Section: Global Experiment Chemistry Week 2013
- Text: **The Global Experiment is the most engaging way to take part in Chemistry Week.** Test your fruit and vegetables for vitamin C using simple kitchen equipment and household items.
- Text: Analyse the results from all Global Experiment participants from around the world.
- Text: Tweet about your Global Experiment experience and share your images using [#globalexperiment](#)
- Link: [Download the Global Experiment instructions and certificate](#)
- Button: Submit your experiment data
- Video player: RSC Global Experiment 2013. Global Experiment 2013. Take part at <http://rsc.li/global-experiment>
- Right sidebar: Newsletter, Feedback

<http://www.rsc.org/learn-chemistry/collections/online-experimentation/global-experiment/chemistry-week-2013>

Photosynq.org (work in progress)

Photosynq

An Open Research Project

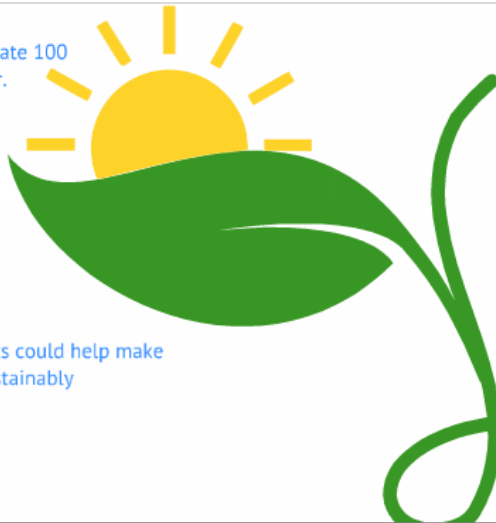
[How it works](#) [Who it's for](#) [Collaborators](#) [Beta Test Application](#)

Our goal is to create a network of low cost, hand-held measurement devices which researchers, educators, and citizen scientists can use to build a global database of plant health.

Photosynthetic organisms on earth generate 100 terawatts of energy from the sun per year.

... that's about 6 times more energy than human beings use!

Understanding how photosynthesis works could help make food and energy more efficiently and sustainably



PROJECT DOCUMENTATION

Photosynq is a completely open-source project which is continually being improved. We document our progress in a couple different ways:

[Blog RSS](#)
[Project Documents](#)
[Project Wiki](#)
[Software Repo](#)
[Discussion List Serve](#)

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eBird.org

[Home](#)[About](#)[Submit Observations](#)[Explore Data](#)[My eBird](#)[Help](#)[Sign In or Register as a New User](#)Translate to: [English](#) | [Español](#) | [Français](#) | [Português](#)

About eBird

Global tools for birders, critical data for science

- Record the birds you see
- Keep track of your bird lists
- Explore dynamic maps and graphs
- Share your sightings and join the eBird community
- Contribute to science and conservation

Overview

A real-time, online checklist program, eBird has revolutionized the way that the birding community reports and accesses information about birds. Launched in 2002 by the Cornell Lab of Ornithology and National Audubon Society, eBird provides rich data sources for basic information on bird abundance and distribution at a variety of spatial and temporal scales.

eBird's goal is to maximize the utility and accessibility of the vast numbers of bird observations made each year by recreational and professional bird watchers. It is

News & Features

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About eBird

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eBird Resources

- › [eBird APIs](#)
- › [eBird Tech Talk](#)
- › [Avibase](#)

GalaxyZoo.org

Few have witnessed what you're about to see

Experience a privileged glimpse of the distant universe as observed by the SDSS, the Hubble Space Telescope, and UKIRT



We are trying something new! Come help us understand a very specific type of galaxy and experience science from start to end. [Take part](#)

Classify Galaxies

To understand how galaxies formed we need your help to classify them according to their shapes. If you're quick, you may even be the first person to see the galaxies you're asked to classify.

[Begin Classifying](#)

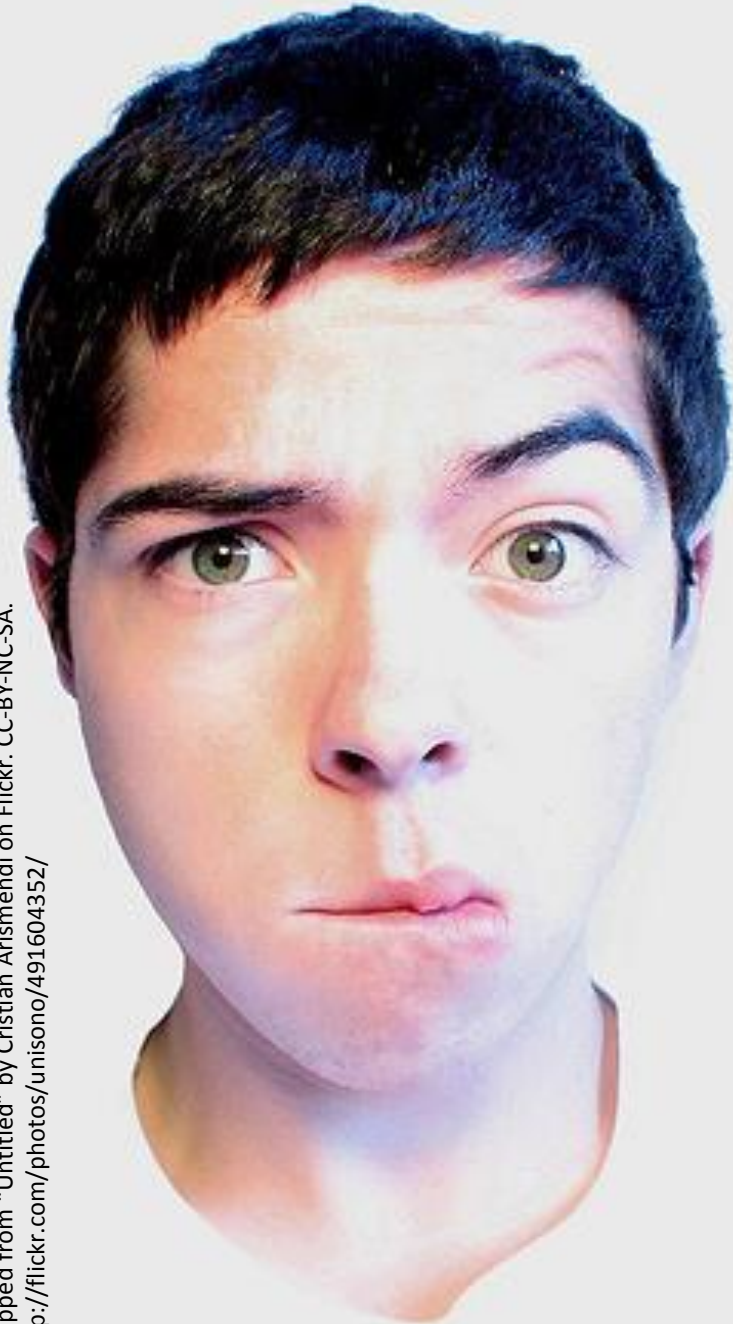


How Do Galaxies Form?

Roughly one hundred billion galaxies are scattered throughout our observable Universe, each a glorious system that might contain billions of stars. Many are remarkably beautiful, and the aim of Galaxy Zoo is to study them, assisting astronomers in

History of Galaxy Zoo

The launch of this new version of Galaxy Zoo, the 4th, comes just a few weeks after the site's 5th birthday. It all started back in July 2007, with a data set made up of a million galaxies imaged by the Sloan Digital Sky Survey, who still provide some of the images in



Big Data Isn't Necessarily Neutral Data

- Kowtowing to data is hot
- InBloom
- Amazon recommender

Big Data can be wrong ...
and your biases can show up!

Try Correlations



Search correlations

[Sign in to enter your own data](#)

[Compare US states](#)

[Compare weekly time series](#)

[Compare monthly time series](#)

Shift series weeks

Country:

Documentation

[Comic Book](#)

[FAQ](#)

[Tutorial](#)

[Whitepaper](#)

Correlate Labs

[Search by Drawing](#)

Find searches that correlate with real-world data

Google Correlate finds search patterns which correspond with real-world trends.

Compare time series

Many search terms vary in popularity over time. To find terms that vary in a similar way to your own time series, enter your data using the link above. Or take a look at these examples to see which search terms:

- [...are more popular in winter](#)
- [...were most likely to be issued in 2005](#)
- [...match the pattern of actual flu activity](#)
(this is how we built Google Flu Trends!)

You can also enter a query into the search box above to find search terms that have a similar pattern of activity, or try one of these:

- [mittens](#)
- [losing weight](#)
- [ribosome](#)

Compare US states

Search terms are often popular in some states and less popular in others. To find terms whose pattern of activity across the United States reflects your own US states dataset, enter your data using the link above. Or, you can find terms correlated with:

- [...the state's latitude](#)
- [...being in New England](#)
- [...annual rainfall in the state](#)

You can also use the search box above to see which searches correlate state-by-state to any query, or try one of these:

- [mittens](#)
- [hunting season](#)
- [southern cooking](#)

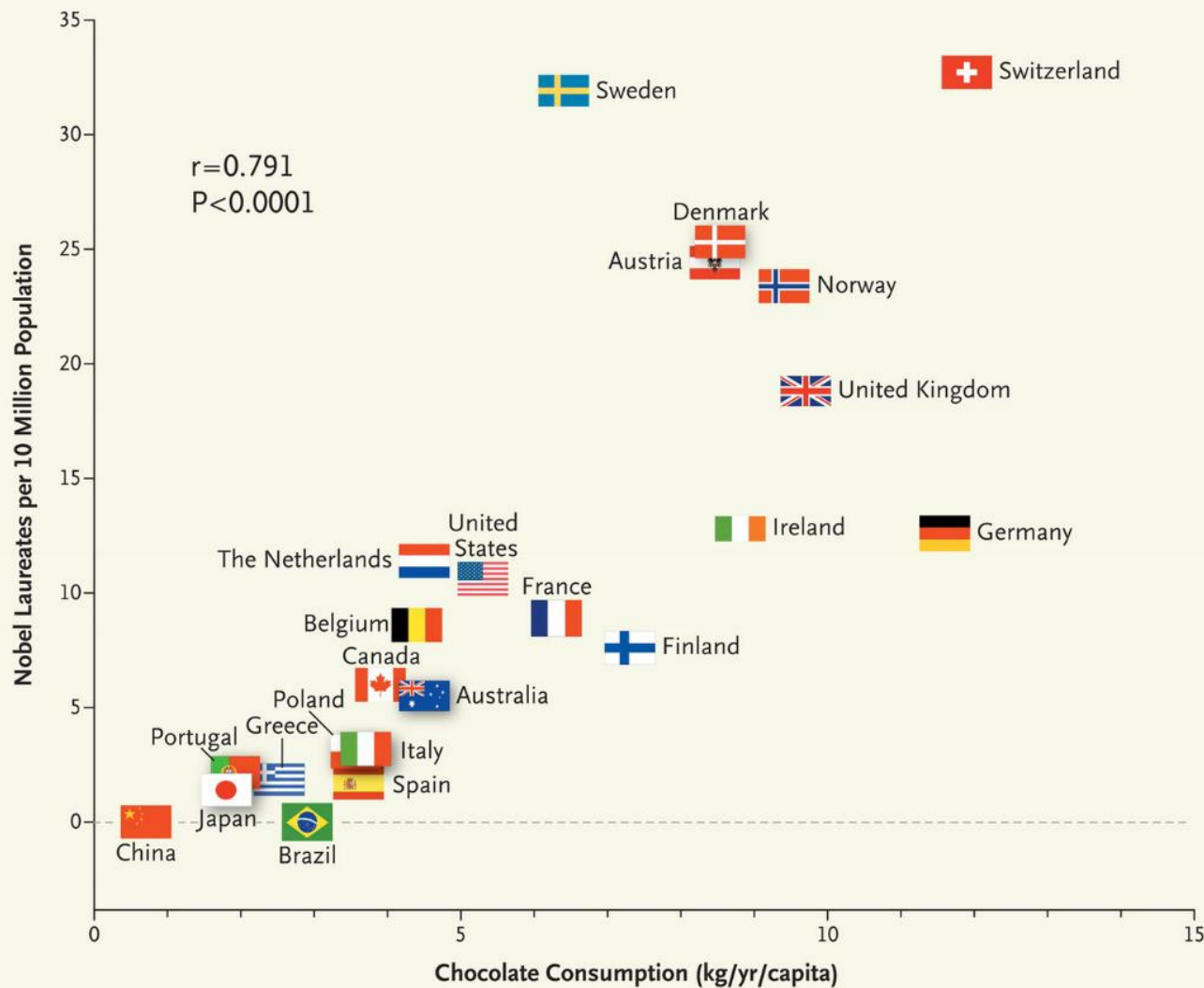
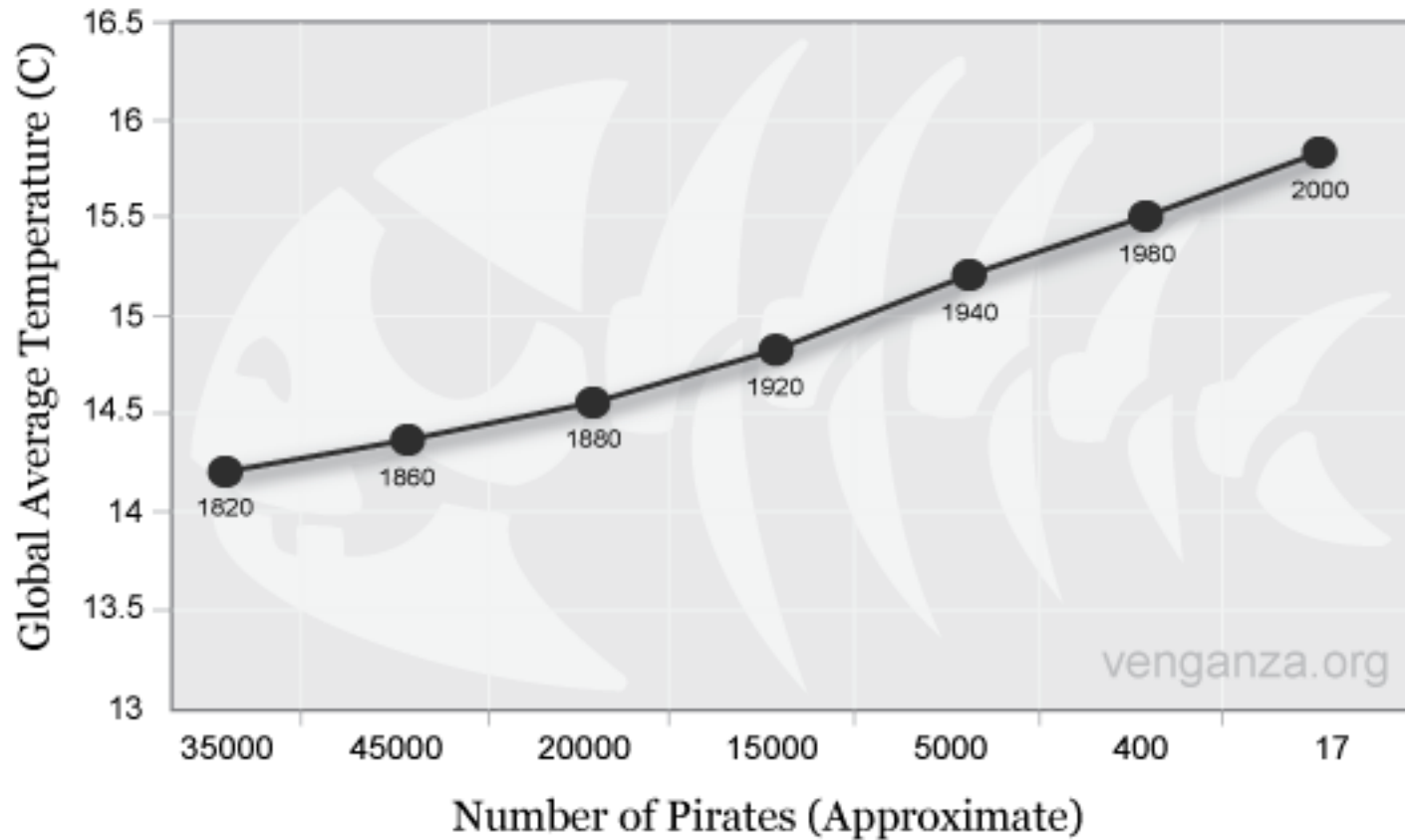


Figure 1. Correlation between Countries' Annual Per Capita Chocolate Consumption and the Number of Nobel Laureates per 10 Million Population.

Messerli, Hans. "Chocolate Consumption, Cognitive Function, and Nobel Laureates." *New England Journal of Medicine* 16.367 (2012): 1562-64. *New England Journal of Medicine*. Web. 18 Nov. 2013.
 <<http://www.nejm.org/doi/full/10.1056/NEJMon1211064>>.

Really?

Global Average Temperature Vs. Number of Pirates



Henderson, Bobby. "Open Letter to Kansas School Board." *Church of the Flying Spaghetti Monster*. N.p., n.d. Web. 18 Nov. 2013. <<http://www.venganza.org/about/open-letter/>>.

https://books.google.com/ngrams

Google books Ngram Viewer

Graph these comma-separated phrases: case-insensitive

between and from the corpus with smoothing of [Search lots of books](#)



Cautions

- Your first, quick correlation may be wrong
- Don't base decisions on averages

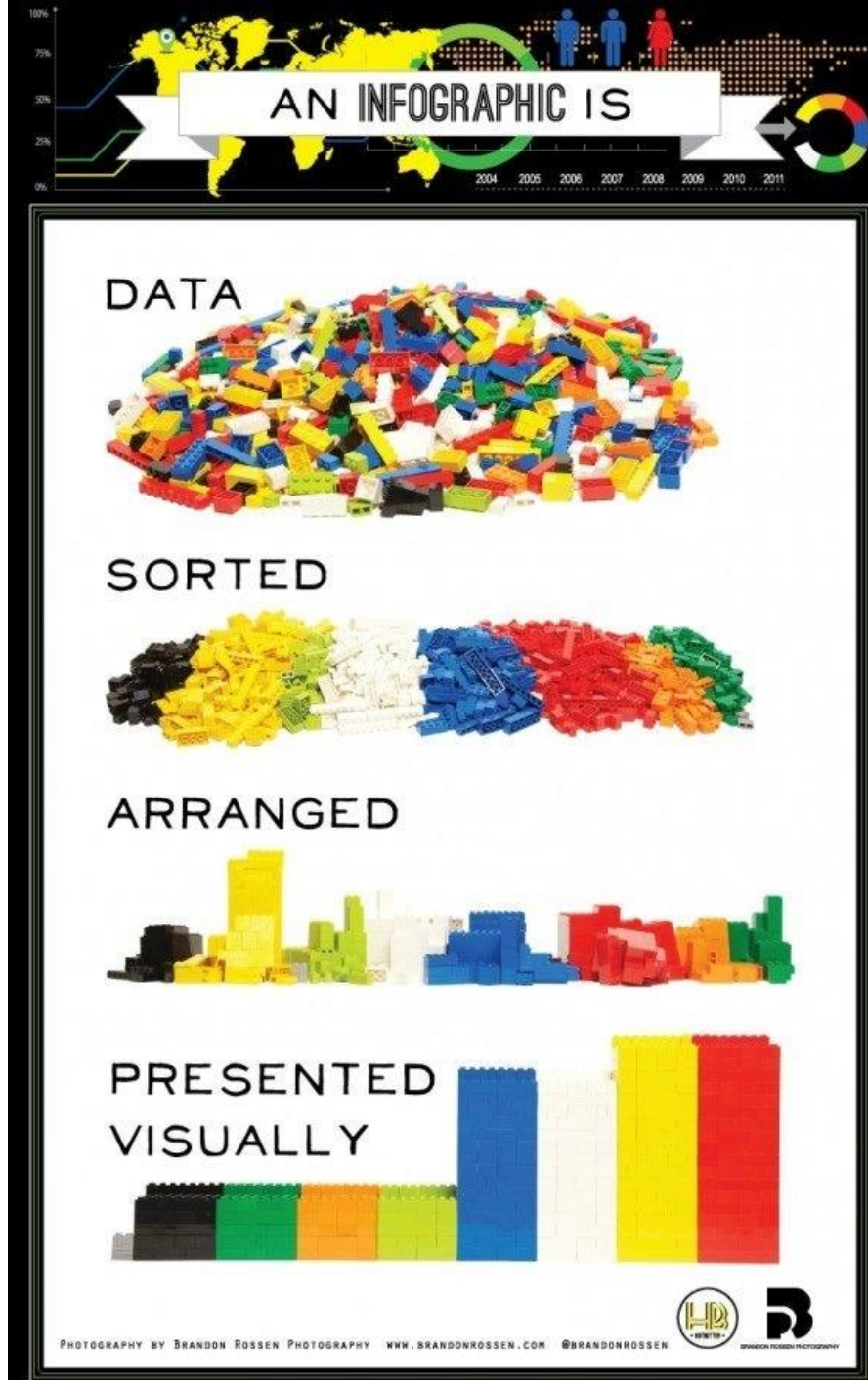
$\mathcal{A} \mathcal{A} \mathcal{A} \mathcal{A} \mathcal{F} = 80\%$

Visual Literacy Competency Standards for Higher Education

“Visual literacy is a set of abilities that enables an individual to effectively **find, interpret, evaluate, use, and create** images and visual media. Visual literacy skills equip a learner to **understand and analyze** the contextual, cultural, ethical, aesthetic, intellectual, and technical components involved in the production and use of visual materials. A visually literate individual is both a critical consumer of visual media and a competent contributor to a body of shared knowledge and culture.”

Teach students how to visualize data

- Arrange data spatially
- To help us understand
- Something useful
- That we couldn't see from the numbers alone



OUTBREAK

Deadliest Pandemics in History

Because a virus doesn't care about state lines or national borders, it can wipe out millions and span multiple continents rapidly. Here is a look at the infectious diseases the world has battled throughout history.





What is a Pandemic?

Derived from the Greek word *pandemos* meaning "pertaining to all people," a pandemic is a widespread disease that affects humans over a wide geographic area.

Key:

PANDEMIC YEAR	DEATH TOLL
	
	
	
	
	
	
	

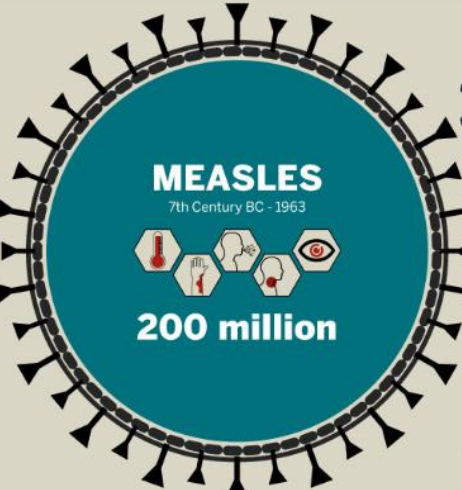
A bubo is an abnormal swelling of the lymph nodes.

			
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Honorable Mentions




Although the following viruses do not have a figure for total amount of lives claimed, they continue to terrorize various areas around the world.


MALARIA 1600 - Today
Common Symptoms
Chills, Headache, Fever, Jaundice, Muscle Pain, Nausea, Vomiting, Seizures
Death Toll
According to the World Health Organization's 2010 "World Malaria Report," an estimated 781,000 people are killed by the virus every year.
TUBERCULOSIS 700 BC - Today
Common Symptoms
Chest Pain, Cough, Fever, Chills, Fatigue
Death Toll
There are almost 2 million tuberculosis-related deaths worldwide every year.
YELLOW FEVER 16th Century - Today
Common Symptoms
Bleeding, Fever, Nausea, Vomiting, Delirium, Seizures, Jaundice
Death Toll
Worldwide, 30,000 deaths are caused by the infection every year.



MEASLES
7th Century BC - 1963




200 million



HIV / AIDS
1981 - TODAY

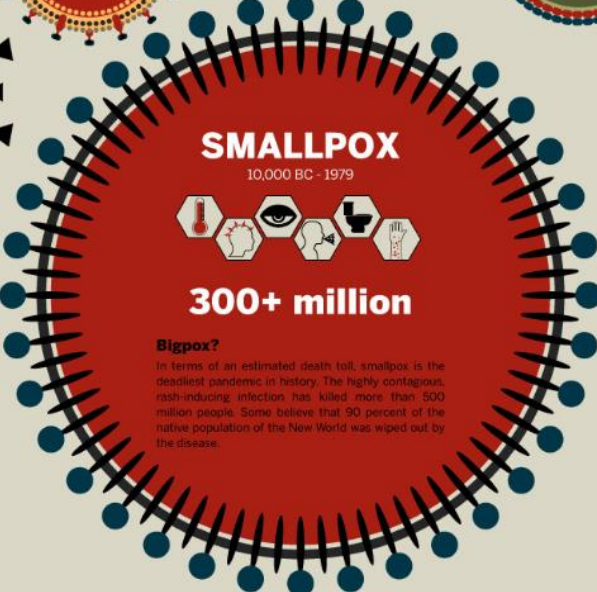
25+ million



PLAGUE OF JUSTINIAN
541 - 750






  




SMALLPOX
10,000 BC - 1979

300+ million




Bigpox?
In terms of an estimated death toll, smallpox is the deadliest pandemic in history. The highly contagious, rash-inducing infection has killed more than 500 million people. Some believe that 90 percent of the native population of the New World was wiped out by the disease.



SPANISH FLU
1918 - 1919

50-100 million


    



THIRD PANDEMIC
1855




12 million



HONG KONG FLU
1968 - 1969

1 million



TYPHUS
430 BC - TODAY

4 million


   



CHOLERA
1817 - TODAY


3 million



BLACK DEATH
1340 - 1771

75 million

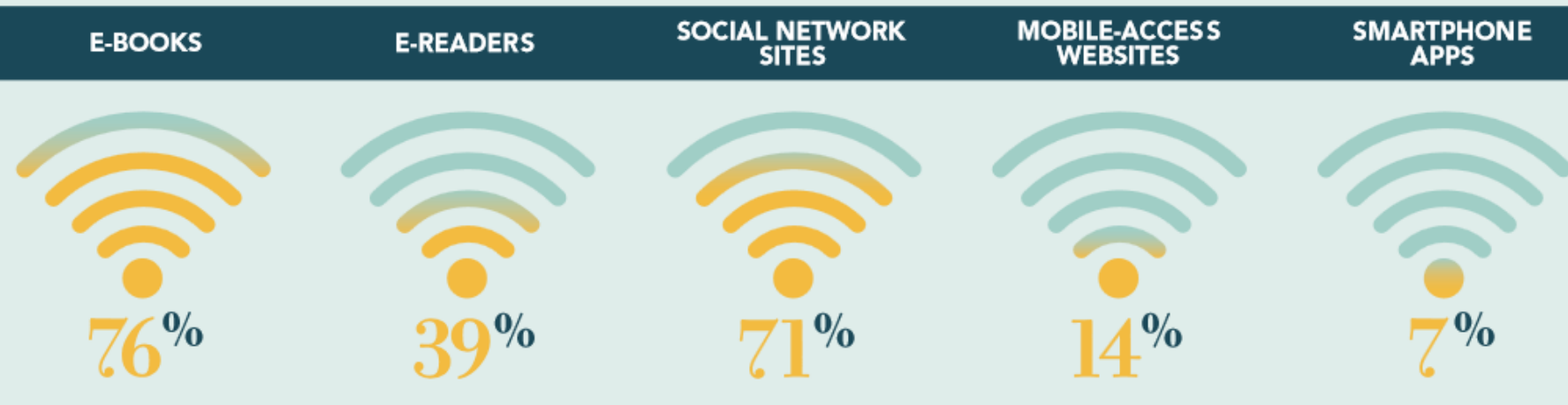


Ring Around the Rosie, a Pocket Full of Plague
Legend says the Black Death plague inspired the children's rhyme "Ring Around the Rosy," which alluded to the rash-like rings and ashes of the deceased victims.

Sources: Mayo Clinic // Centers for Disease Control and Prevention // World Health Organization // New York Times // National Center for Biotechnology Information

"Outbreak: The Deadliest Pandemics in History." Infographic. GOOD. GOOD Worldwide, 11 Aug. 2011. Web. 29 Dec. 2012. <<http://awesome.good.is/transparency/web/1108/deadliest-pandemics/flash.html>>.

FIGURE A-2: U.S. PUBLIC LIBRARIES: TRENDS IN E-BOOKS AND E-ACCESS



Percentage of libraries that offer services, FY2012

Museum and Library Services (IMLS) released *Building Digital Communities*² designed to raise awareness about the access essential to digital communities and identify goals and strategies for focus in digital inclusion efforts (e.g., economic and workforce development, education and civic engagement). Last year, the Department of Commerce's National Telecommunications and In-

and the general public, and for marketing purposes.

- Almost half of public libraries (45.6 percent) report using communication tools (e.g., Blogger, WordPress, Vox, Twitter) to reach the public.

- Over a third (37.3 percent) report using photography sites (e.g., Flickr, Zoomr).

enced a notable uptick in smartphone market penetration over the last year.

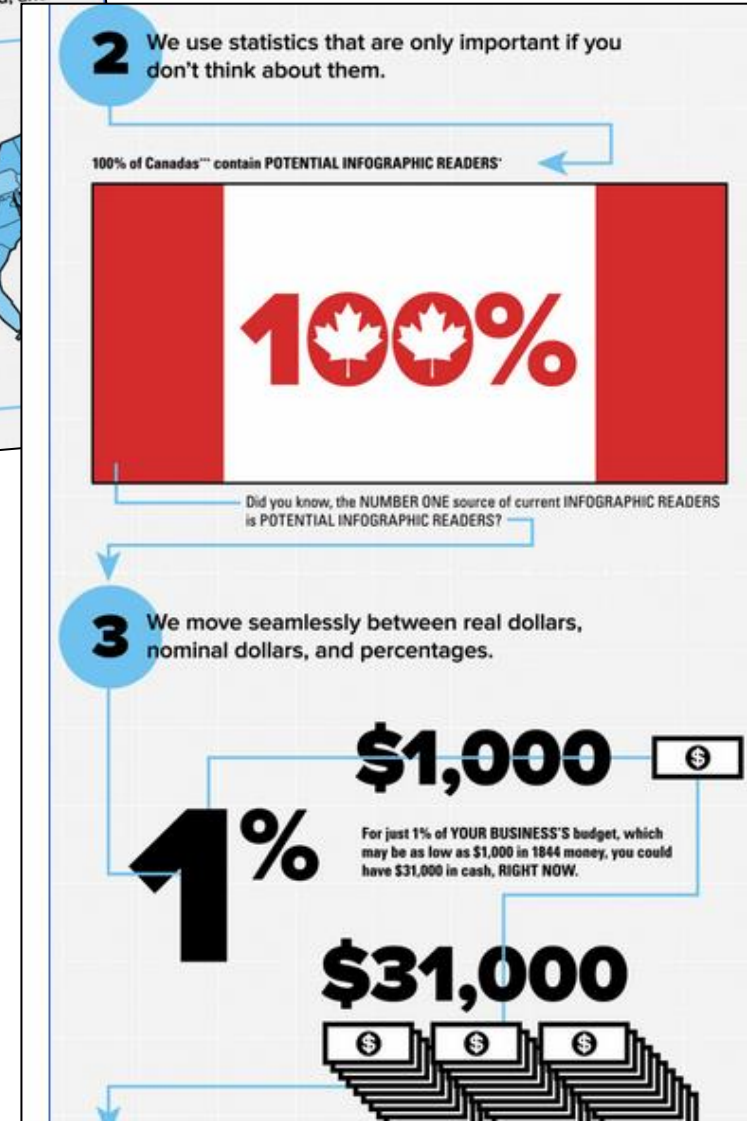
David Lee King, digital branch and services manager, Topeka and Shawnee County (KS) Public Library, reported in his April 5, 2012 [blog post](#) that in March 2012, slightly more than 11 percent of their library website visits were via a mobile device. Referencing the Pew smartphone survey

Teach students which chart to use

- **Line charts** analyze trends, patterns over time
- **Bar charts** compare categories of data within a time period
- **Scatter plots** show how two attributes vary together
- **Histograms** view and compare distributions

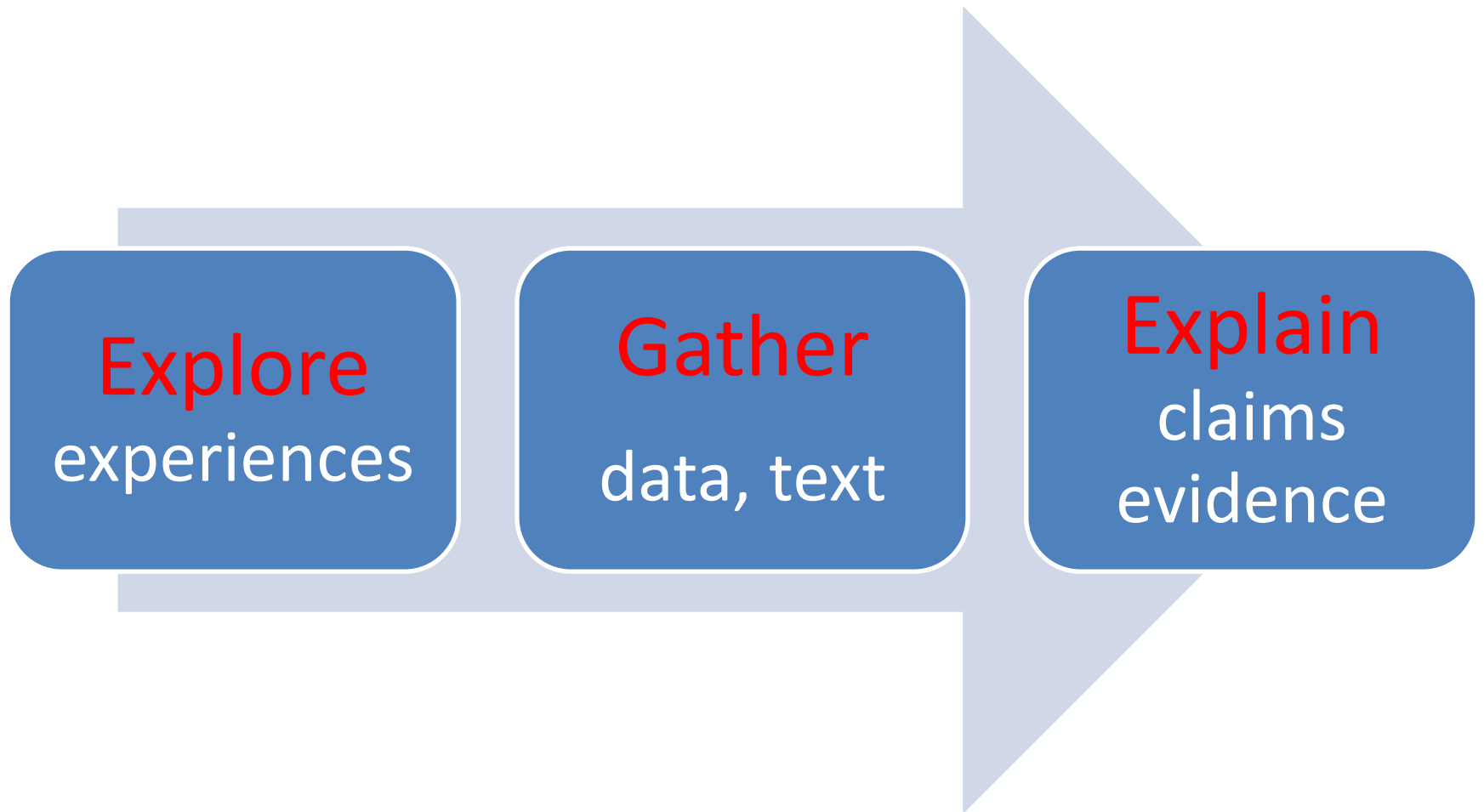
The visualization has to be:

- Accurate
 - Thorough
 - Simple
 - Truthful
 - Clear
- (“Chart junk” – Tufte)



McNulty, Johnny. "This Is the Most Perfect Infographic Ever Created. It's about Why Infographics Suck." *Pics & Posts*. Someecards, 12 Nov. 2013. Web. 18 Nov. 2013. <<http://happyplace.someecards.com/27460/this-is-the-most-perfect-infographic-ever-created>>.

Data can be used as evidence (Common Core, Next Gen Science)



Argument in writing (CER+A)

- Claim or thesis
- Backed up with evidence
- Reasoning that supports idea / claim
- + Alternatives (Rebuttal)

Teaching with data

- Using real-time or archived published data
- Collect their own data
- Contribute data to larger sets
- Evaluate data
- Create products and papers using data
- Others...?



**I WANT
YOUR CONTENT**

Exploration Time!

- Opportunityindex.org
- Socialexplorer.com
- Galaxyzoo.org
- eBird.org
- Books.google.com/ngrams
- google.org/flutrends/us/
- google.com/trends/correlate

Debrief and Discussion





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Slides

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