

Institutional Innumeracy: Construction and Deconstruction

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“Senior Expedition” at my school

Pick a topic. Any topic!

Write a 30 page research paper based on 2 expert interviews, field work, and research from 25 scholarly articles.

Prepare a 60 minute presentation on your topic and present it to a panel of 3 strangers.

The panel determines if you get your diploma (**SCARY**)

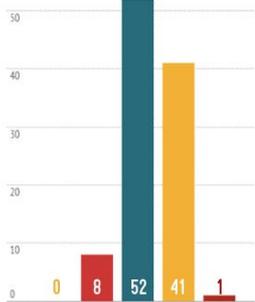


Sample topics....

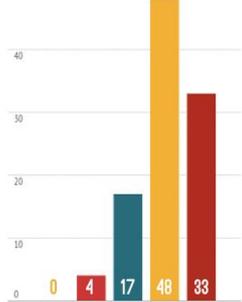
- “Sexual Assault and Harassment”
- “Gentrification in DC”
- “Transgender Identity”
- “Deportations to El Salvador”
- “Art Therapy for Autism”

STUDENT SLEEP STATISTICS

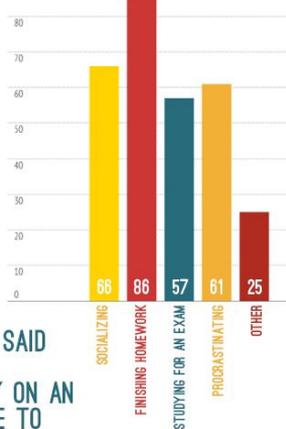
HOURS USUALLY SLEPT ON WEEKNIGHTS



HOURS USUALLY SLEPT ON WEEKENDS

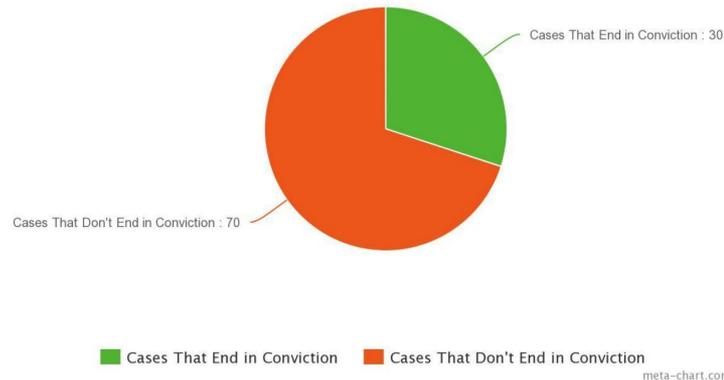


REASONS FOR GIVING UP SLEEP



73 OUT OF 102 STUDENTS SAID THAT THEY FELT THEY PERFORMED INADEQUATELY ON AN ASSIGNMENT OR EXAM DUE TO LACK OF SLEEP

Percentages of Rape Cases That End in Conviction
(Offering the Rape Victim Real Help, 2)



“Where did you get these stats?”



The urgency is more relevant than ever

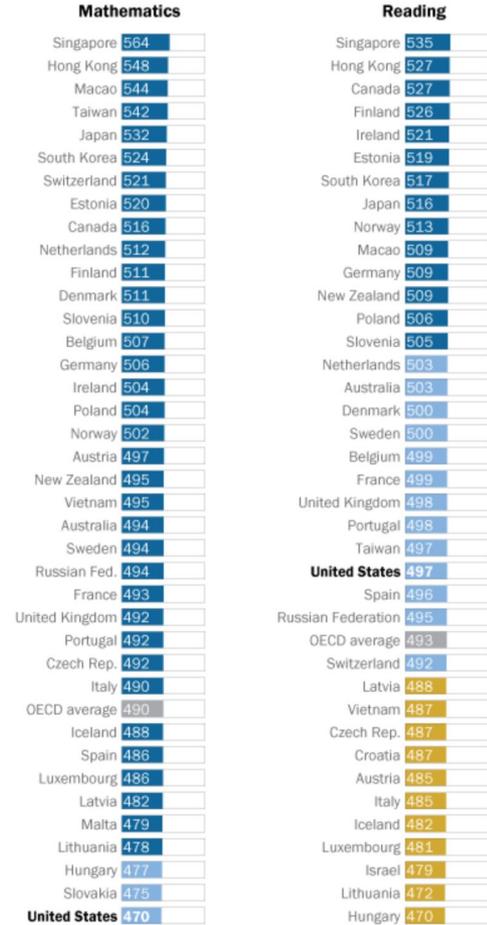
THE WALL STREET JOURNAL.

WORK & FAMILY

Most Students Don't Know When News Is Fake, Stanford Study Finds

Teens absorb social media news without considering the source; parents can teach research skills and skepticism

If students are better at literacy achievement than mathematical achievement and still can't accurately identify fake news, how do we expect them to identify fake numbers?



OECD, PISA 2015, and Pew Research Center

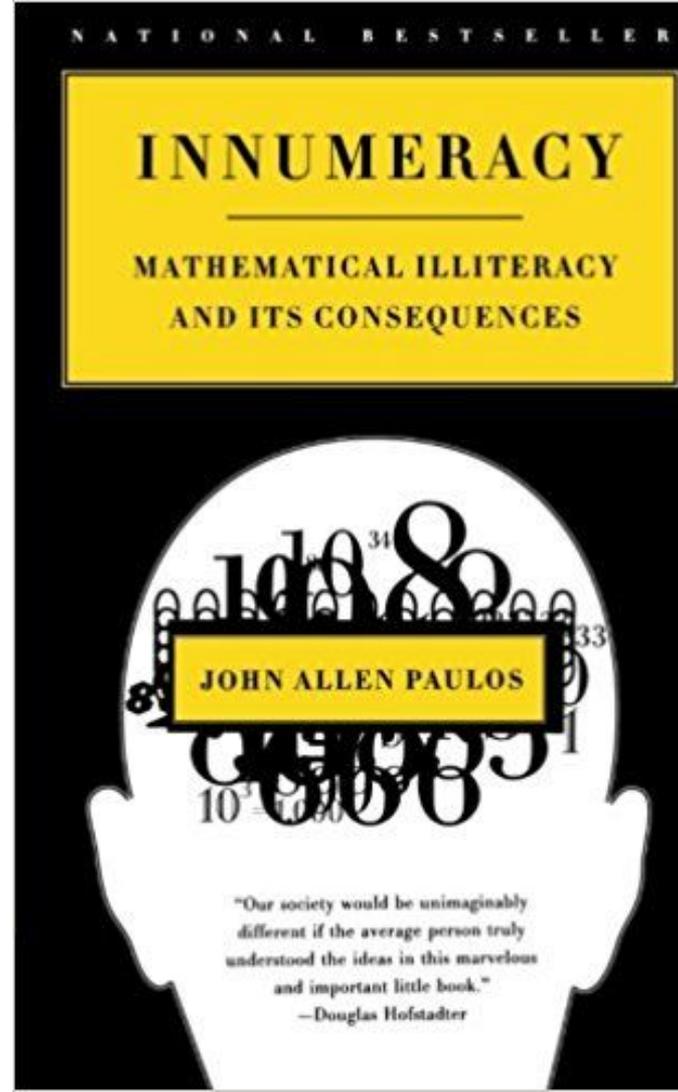
<http://www.pewresearch.org/fact-tank/2017/02/15/u-s-students-internationally-math-science/>

Just as it can be a tool
to empower and inform,
mathematics can
become a tool to
manipulate and lie

Look beyond the consequences of Individual Innumeracy and consider Institutional Power

“Innumeracy, an ability to deal comfortable with the fundamental notions of number and chance, plagues far too many otherwise knowledgeable citizens. The same people who cringe when words such as “imply and “infer” are confused react without a trace of embarrassment to even the most egregious of numerical solecisms... one rarely discussed consequence of innumeracy is its link with belief in pseudoscience... even more ominous is the gap between scientists’ assessments of various risks and the popular perceptions of those risks, a gap that threatens eventually to lead either to unfounded and crippling anxieties or to impossible and economically paralyzing demands for risk-free guarantees.

John Allen Paulos, *Innumeracy: Mathematical Illiteracy and Its Consequences*, 1988





Matt Corby ▶ Subway

5 hours ago · 🌐

subway pls respond



The “Magic of the Mall”: An Analysis of Form, Function, and Meaning in the Contemporary Retail Built Environment

Jon Goss

Department of Geography, University of Hawaii, Honolulu, HI 96822

added). Escalators sweep them up to galleries decorated with mobiles—typically birds, flags and balloons that dramatically evoke flight and colorful action—or take them down to underworld grottos, under arches and hanging gardens. This experience disorients the shopper and, just as in the fantasy worlds of popular literature and film, it is then notoriously difficult to find one’s way out. According to one designer, “a too direct and obvious a route between the entrance and exits must be avoided” (Beddington 1982, 16), and exits must be carefully designed because “if too prominent and inviting as seen from within they may sweep the unsuspected (sic) shopper from the centre” (Beddington 1982, 27). Even fire exits are disguised as shopfronts or hidden behind mirrors almost to the point of invisibility (Scott 1991, 192–93). The mall is thus designed as a noncommutative space, and the goal is to trap the consumer in the world of consumption.

The shopping center is, therefore, a *strategic* space, owned and controlled by an *institutional power*, which, by its nature, depends upon the definition, appropriation and control of territory (De Certeau 1984). Its designers seek to deny the possibility of *tactics*, an oppositional occupation by everyday practices;

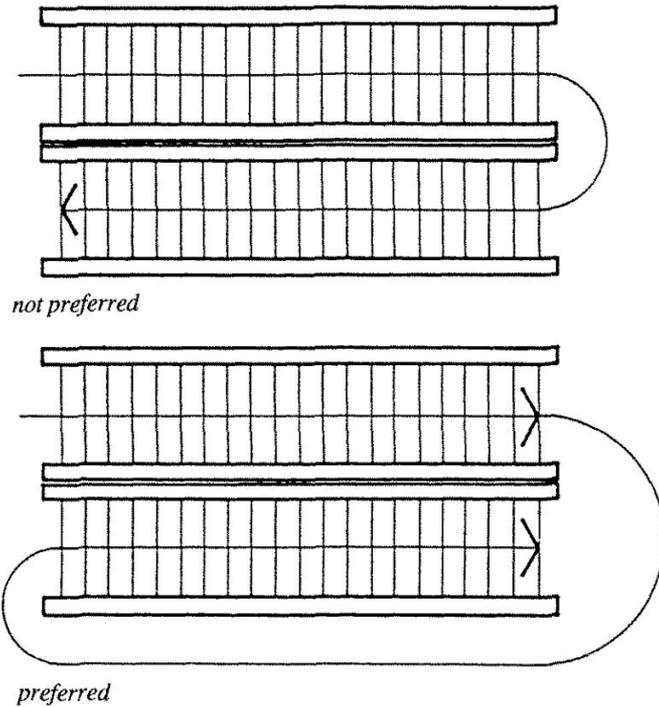


Figure 2. Recommended orientation of escalators from a design manual. Source: Beddington (1982, 75).

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Quick Application

Apply online in minutes



Instant Decision

Receive an immediate decision*



Fast Funding

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INTEREST. This is a Simple Interest Loan, early payment will decrease the amount of the Finance Charge and late payment will increase the amount of the Finance Charge.

For example:

Amount Financed	Interest Rate	#Days in year	Interest Per day
\$200	x 625%	/ 365	= \$3.57

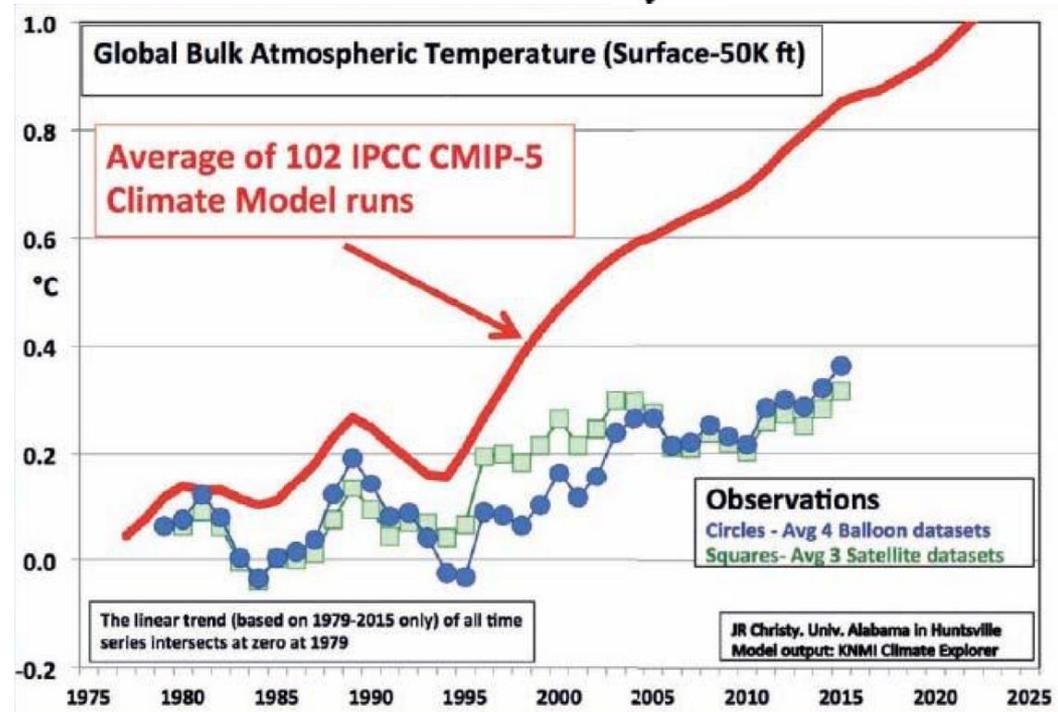
If this sample loan was paid in 7 days, interest owed would be: 7 days x \$3.57 = \$24.99. If it were paid in 22 days interest owed would be 22 days x \$3.56 = \$78.54.

Do Climate Scientists lie????

“But the involvement of the Heartland Institute, which [posted a billboard](#) in May comparing those who believe in global warming to domestic terrorist Theodore J. Kaczynski, shows the breadth of conservatives’ efforts to undermine environmental initiatives on the state and federal level. In many cases, **the groups involved accept money from oil, gas and coal companies that compete against renewable energy suppliers.**

The Heartland Institute received \$736,500 from Exxon Mobil between 1998 and 2006, according to the group’s spokesman Jim Lakely, and \$25,000 in 2011 from foundations affiliated with Charles G. Koch and David H. Koch, whose firm Koch Industries has substantial oil and energy holdings.”

Washington Post, *Climate Sceptic Group Works to Reverse Energy Mandates* 11/24/2012
https://www.washingtonpost.com/national/health-science/climate-skeptic-group-works-to-reverse-renewable-energy-mandates/2012/11/24/124faaa0-3517-11e2-9cfa-e41bac906cc9_story.html



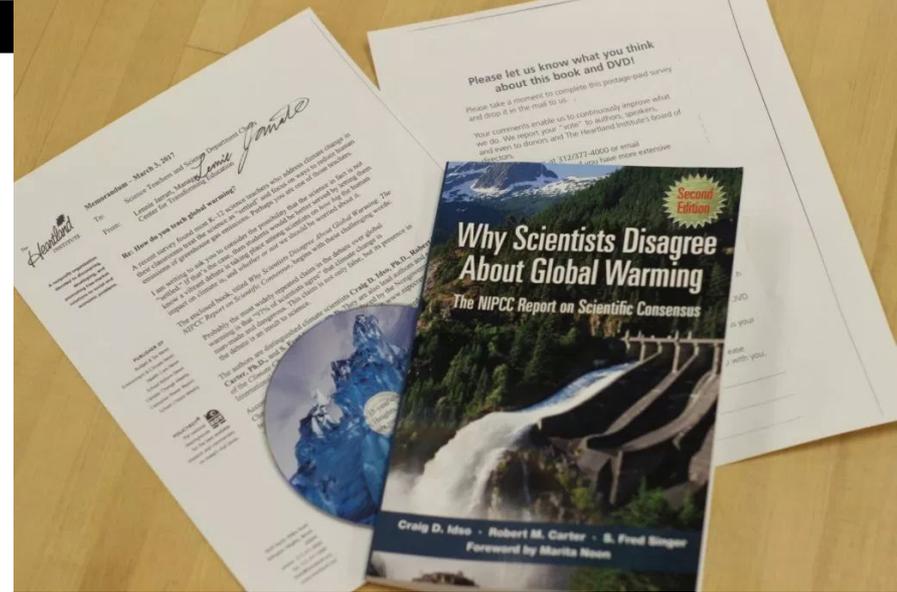
Heartland Institute, *This Chart Shows the Decades-Long Failure of Alarmist Climate Models* <https://www.heartland.org/Center-Climate-Environment/index.html>

CLIMATE OF DOUBT

Climate Change Skeptic Group Seeks to Influence 200,000 Teachers

Twenty-five thousand science teachers opened their mailboxes this month and found a package from the Heartland Institute, a libertarian think tank that rejects the scientific consensus on climate change. It contained the organization's [book](#) "Why Scientists Disagree About Global Warming," as well as a DVD rejecting the human role in climate change and arguing instead that rising temperatures have been caused primarily by natural phenomena. ***The material will be sent to an additional 25,000 teachers every two weeks until every public-school science teacher in the nation has a copy,*** Heartland president and CEO Joseph Bast said in an interview last week. If so, the campaign would reach [more than](#) 200,000 K-12 science teachers...

That polarization could easily be exacerbated at South Whidbey High School in Washington state, where biology and physics teacher Greg Ballog received the material. Ballog said that one of his colleagues is a "borderline climate denier," which has already caused tensions in the school's science department. ***"I'm not going to show this stuff to him," he said. "It's pretty slick. I think he might use it."***



PBS Frontline, Climate Change Skeptic Group Seeks to Influence 200,000 Teachers, <https://www.pbs.org/wgbh/frontline/article/climate-change-skeptic-group-seeks-to-influence-200000-teachers/>

Srsly tho: what counts as mathematics?

George Joseph is criticizing the dominance of a Eurocentric (and male) mathematical hegemony which has created a judgmental situation within the discipline whereby, for example, deciding what constitutes powerful mathematics, or when a proof proves and what form a rigorous argument takes, is dictated and reinforced by those in influential positions. How often do we hear statements, often made about a geometric proof, dismissing it as 'merely a demonstration' or the suggestion that computer-assisted proofs are not quite as 'good' as those developed without a computer? How frequently are students encouraged to believe that the mathematico-scientific and technological development of the West has been made independently of a systematic knowledge and resource exploitation of the rest of the world? The colonization of mathematics has been so successful that the history of their own mathematical culture and its contribution to knowledge is often unknown to students in Africa, Asia and Latin America. Such bias is increasingly under attack

- Who produces mathematical knowledge?
- What counts as math?
- Who owns it?
- How is mathematics imposed on other people?
- What is the role of mathematics in perpetuating violence and oppression?

Gabriele Kaiser, *Equity in Mathematics Education: Influences of Feminism and Culture*

Every mathematical
concept we now
accept as “fact”
was a deliberate
decision made by a
person.

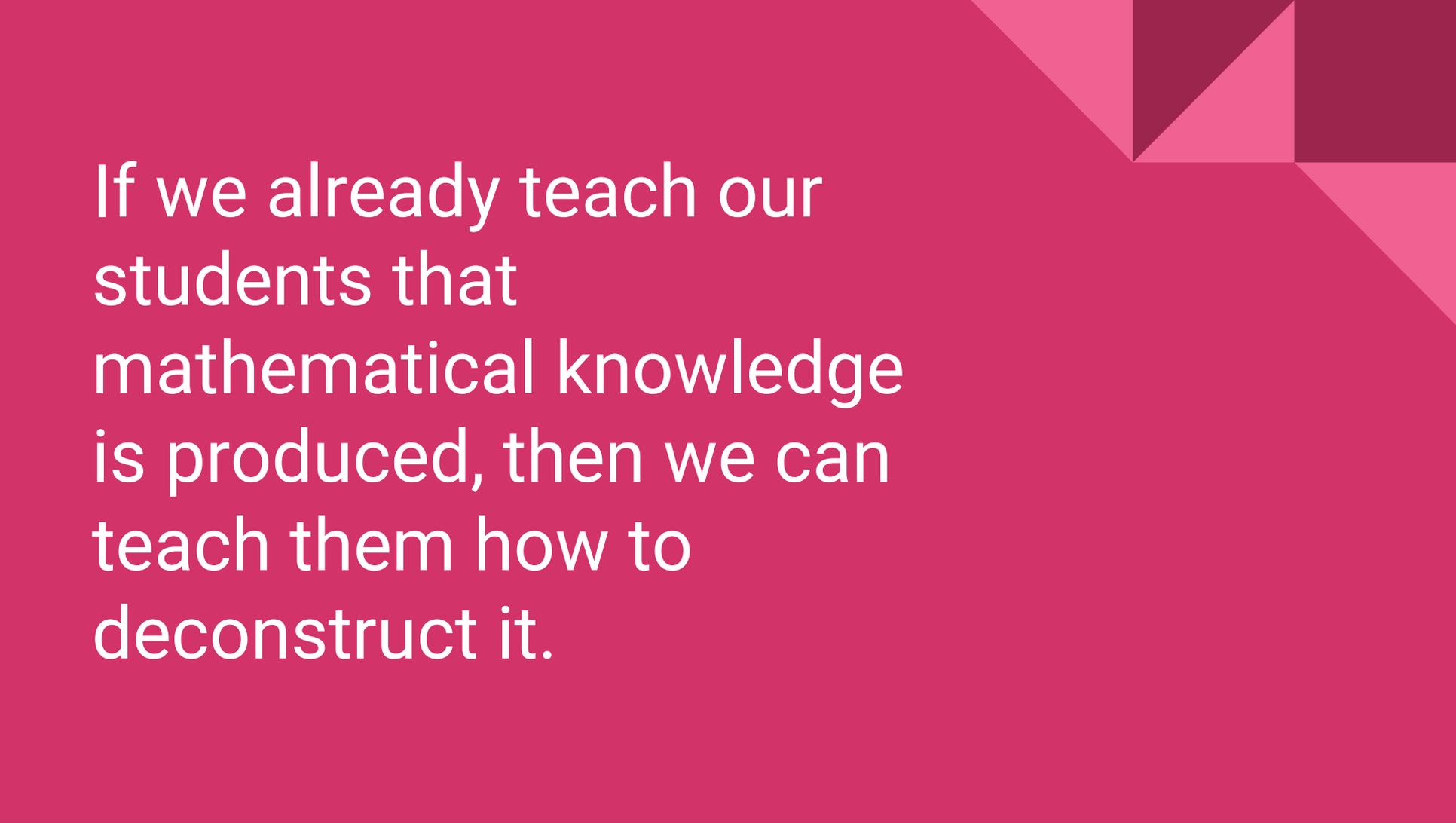
Institutions of Power

Deconstructivist
Learning,
Skepticism, Critical
Analysis

Your Math Toolkit! The things you already use in your classroom!

Knowledge Production,
Constructivist Learning/
Conceptual Knowledge

Students and Classroom



If we already teach our students that mathematical knowledge is produced, then we can teach them how to deconstruct it.

Can Owning a Dog cure your Depression?



Kai Sam Ng <kng@ccpcs.org>

to AP

11/14/17



Saw this article today in the news... Extra credit to the first person who can describe exactly what is wrong with the news article's conclusions (attached):

<http://www.mdmag.com/medical-news/how-dogs-could-help-patients-with-hiv-live-longer>

(you might have to click through the article and skim the actual study)

How Dogs Could Help Patients with HIV Live Longer

NOVEMBER 14, 2017

Thomas Castles

@Thomas_Castles



A new study published in JMIR suggests that dog ownership reduces the likelihood of depression, which can help confer long-term health benefits on people living with HIV.

HIV patients are about twice as likely to be depressed as people who are HIV-negative, according to the report. This can be problematic, because depression often leads to reduced adherence to life-saving antiretroviral therapy (ART) regimens.

"We know that stigma is still very much real for many people affected by HIV, and that stigma can lead to feelings of isolation, loneliness or depression," said Robert Garofalo, MD, MPH, of the Division of Adolescent Medicine at Ann & Robert H Lurie Children's Hospital of Chicago. "While doctors cannot readily write a prescription for a dog for their patients, this study suggests that dog ownership or aspects of unconditional love and social engagement that may come with having a pet, could be beneficial to patients who are isolated or depressed as a result of their HIV infection."



Robert Garofalo, MD, MPH

To determine the effect of pet ownership on the mental status of HIV patients, Garofalo and colleagues recruited 199 participants via social media who were aged 18 years or older and who self-reported an HIV diagnosis to participate in *When Dogs Heal*, a cross-sectional web-based survey.

"To recruit participants, messages were posted to social media platforms (eg, Facebook and Twitter) by the principal investigator, who posted about the study one time on each platform. Participants were incentivized to participate by offering a chance to win an Apple iPad. Eligibility criteria included was being ≥ 18 years old and self-reporting an HIV diagnosis; dog ownership was not a requirement to enroll."

Washington Post... seriously??



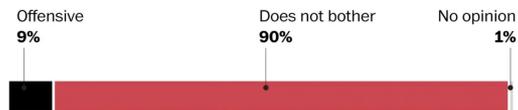
Kai Sam Ng <kng@ccpcs.org>

https://www.washingtonpost.com/local/new-poll-finds-9-in-10-native-americans-arent-offended-by-redskins-838753295f9a_story.html?utm_term=.4582f8deff87

This is a really dumb poll. Figure out why.

POLL Washington Post poll

Q: The professional football team in Washington calls itself the Washington Redskins. As a Native American, do you find that name offensive, or doesn't it bother you?



Source: This Washington Post poll was conducted by telephone Dec. 16 to April 12 among a random national sample of 504 Native American adults. Interviews were conducted by live interviewers on conventional and cellular phones. The margin of sampling error for overall results is 5.5 percentage points. Sampling, data collection and tabulation by SSRS of Media, Pa. Full results and methodology are available at wapo.st/pollarchive

SCOTT CLEMENT AND CRISTINA RIVERO/THE WASHINGTON POST

What happens when it turns out most experiments aren't replicable?



Kai Sam Ng <kng@ccpcs.org>

to AP

<https://www.nature.com/news/reality-check-on-reproducibility-1.19961>

Scientists go into an existential crisis.



NATURE | EDITORIAL

Reality check on reproducibility

A survey of *Nature* readers revealed a high level of concern about the problem of irreproducible results. Researchers, funders and journals need to work together to make research more reliable.

Figure out why this high school student is an idiot with statistics:



Kai Sam Ng <kng@ccpcs.org>

to AP

<http://www.sacbee.com/news/local/education/article199440204.html>

Hint: it has do with his sampling method.

High school science fair project questioning African American intelligence sparks outrage



BY DIANA LAMBERT AND ANITA CHABRIA
dlambert@sacbee.com



February 10, 2018 12:00 AM
Updated February 11, 2018 01:05 PM

Questions to Analyze Power... and in your class

1. Who holds power?
 2. Where is power exercised? Where is power exercised from?
 3. What does this power look like?
 4. Why is this power being exercised?
 5. Why study power?
 6. How is this power exercised? By what means is it exercised?
1. Who made these numbers?
 2. Where did these numbers come from?
 3. If these numbers were supposed to influence, what was the intended effect?
 4. Why were these numbers produced? What's the agenda?
 5. Why study the power of these numbers?
 6. How is this power exercised? By what means is it exercised?

#1-4 from Oxfam, *Quick Guide to Power Analysis*;

http://www.powercube.net/wp-content/uploads/2009/11/quick_guide_to_power_analysis_external_final.pdf;

#5-6, Michel Foucault, *The Subject and Power*, <http://www.jstor.org/stable/1343197>

There are resources for fake news out there, but not really for fake numbers

- Let's make it!
- Email me at kaisamng@gmail.com
- Ok bye



Curious if the site you are viewing is legit or not? See where it falls on the Legit-O-Meter.

★ ★ ★ Legit-O-Meter ★ ★ ★

FAR LEGIT	LEGIT	MIDDLE	FAKE	FAR FAKE
	Ends with ".org," ".gov," or ".edu." <i>These sites tend to carry a little more credibility.</i>	Unusual URL endings (such as ".com.co"). <i>These sites might be mimicking legitimate sites or trying to appear legitimate, so watch out, as they could have false or misleading "facts."</i>	Images seem too good to be true or evoke a strong reaction. <i>Proceed with caution. You might be looking at a hoax. Do a reverse image search and see if you can uncover the original image.</i>	
	Has images with credits.		Tons of pop-ups and banner ads. <i>Be aware that what you're reading might only be clickbait.</i>	
	Headlines seem direct and to the point. <i>Be aware that what you're reading might only be clickbait.</i>	Says "Sponsored Content." <i>Simply means paid-for advertising.</i>	The headlines are using words such as "epic," "amazing," "unbelievable," or "incredible." <i>Worth some hesitation if a headline is having to work overtime to grab your attention.</i>	
	Evokes a strong emotional reaction. <i>Real news stories can make you feel a gut reaction.</i>		Evokes a strong emotional reaction. <i>Non-legit stories and sources try to mess with your emotions to get you to click.</i>	
	Date is accurate, and other organizations are reporting on the same story.		Does the date seem outdated or inaccurate? <i>Tread lightly, as some social media will often resurrect outdated stories.</i>	
	"About Us" lists information about author, organization, etc. <i>Authors and contributors are credible sources.</i>	No "About Us" information? Have to register for more information? <i>Be careful. The fact that they aren't being transparent is a red flag!</i>		