

Research is More than **Googling**:

Del Siegle, PhD
Director, National Center
for Research on
Gifted Education

UCONN
del@uconn.edu

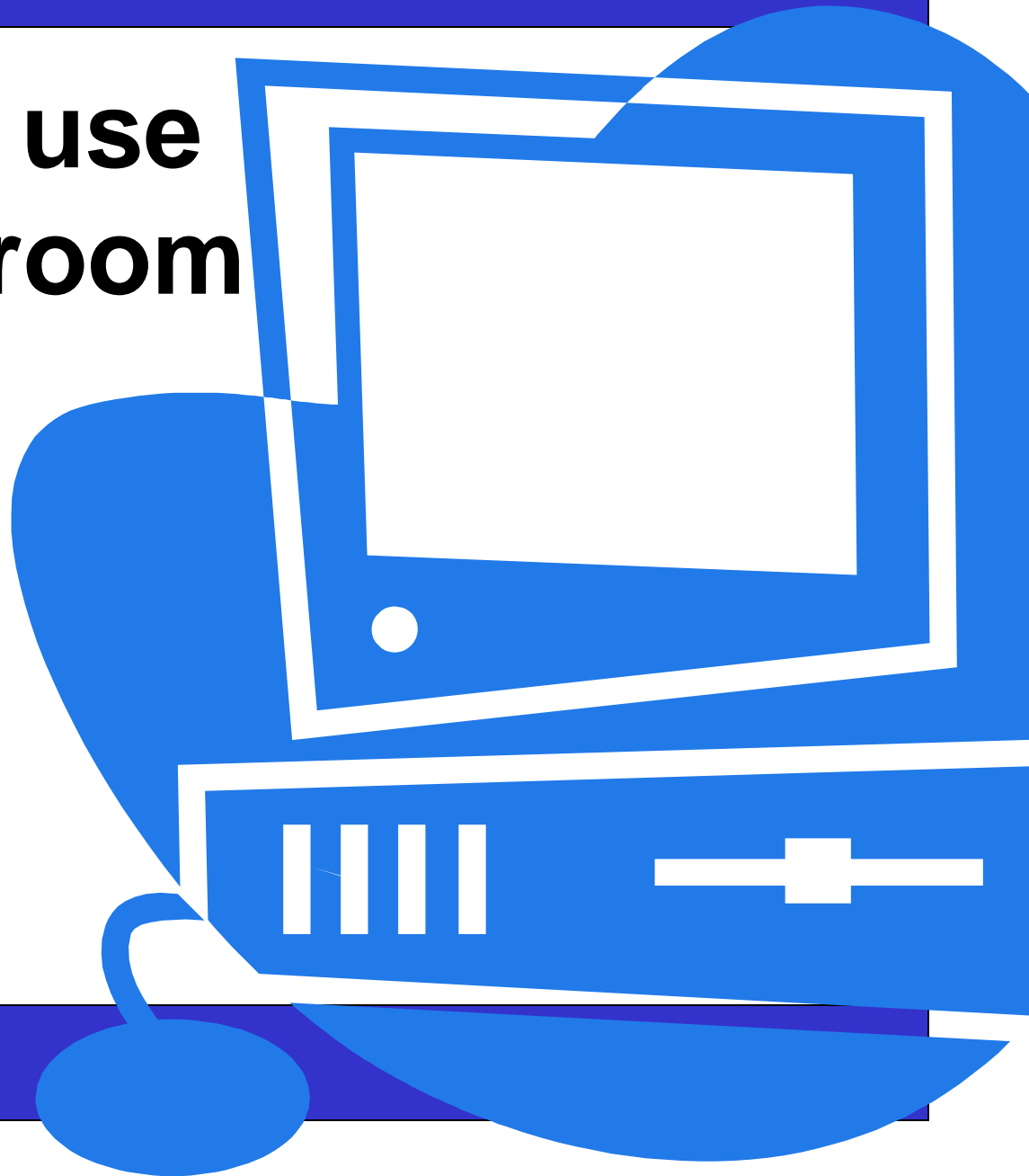


<http://researchbasics.education.uconn.edu>

When students think of research, they usually think about looking something up on the Internet and writing a report. However, a more exciting type of research exists that involves collecting and analyzing data. Students of all ages love to pose questions and search for answers. We will also share how to use existing, free, or low cost software to better understand data and make research more meaningful for your students.

Living Earth, Post IT, Dollar Street, Gapminder, and Excel/Google Sheets

**Technology use
in the classroom
has
progressed
through 3
distinct
stages.**



Automated Print



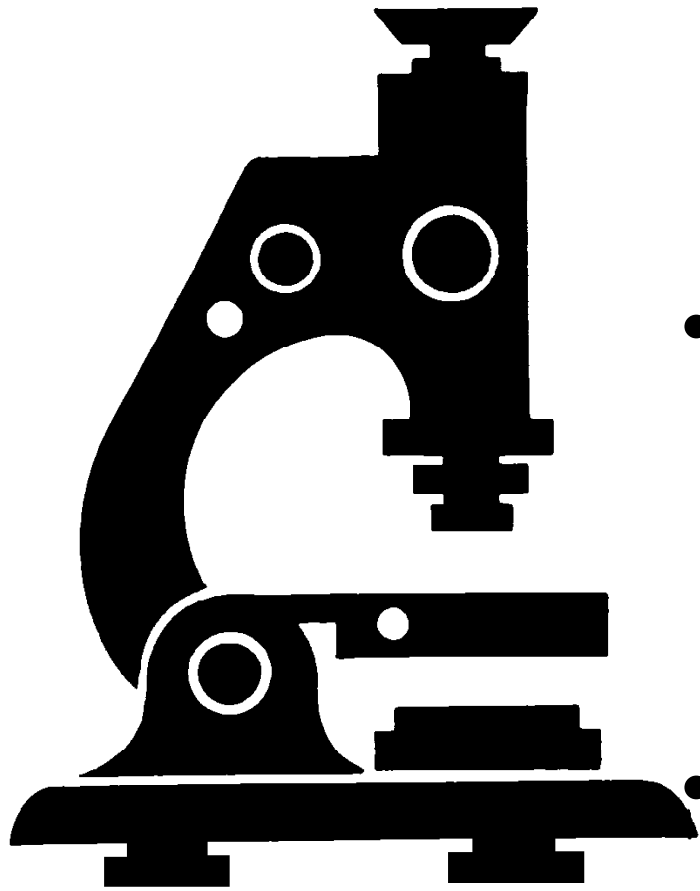
Automated
Print
**Production
Tool**



Automated
Print
Production
Tool
**Data Driven
Decision
Making/Coding**



WHAT IS REAL RESEARCH?



- Investigates a question that does not have a predetermined answer
- Gathers, records, and interprets raw data
- Presents conclusions



**The Research Process
Creates an
Opportunity for
an Open-Ended,
Inquiry-Based
Approach
to Learning**

...our goal is to allow students to construct knowledge by providing them with opportunities to ask questions, gather information, organize it in meaningful ways, and present it to others. In this way, the student is actively engaged with the technology and uses it as a productive learning tool.



**The Research
Process Helps
Students...**

**Identify
Problems**



**Discover Trends
and Patterns**

A large, stylized white number 5 is centered on a black background. The number is composed of thick white lines and curves. The top part of the 5 is a large, rounded shape that tapers to a point on the left. The middle part is a vertical stem that curves to the right at the top and bottom. The bottom part is a large, rounded shape that tapers to a point on the left, mirroring the top part.

**Critically Evaluate
Research Findings**

140,000 – 190,000

1.5 million

2X



- **What day of the week are people most and least depressed?**
- Depression is highest on Monday and lowest on Saturday
- **On what day of the year are people most and least depressed?**
- Depression is highest on February 27 and lowest on December 25 with depression highest in April
- **Does temperature influence depression?**
- Lower temperatures are associated with higher levels of depression
- **How does education affect depression?**
- Having more college-educated people in an area is associated with lower depression (Stephens-Davidowitz, 2013)



SEWER

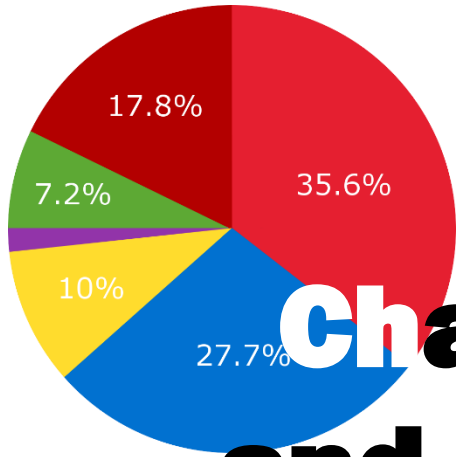
DAVID DRY USA

A 1305 04-06

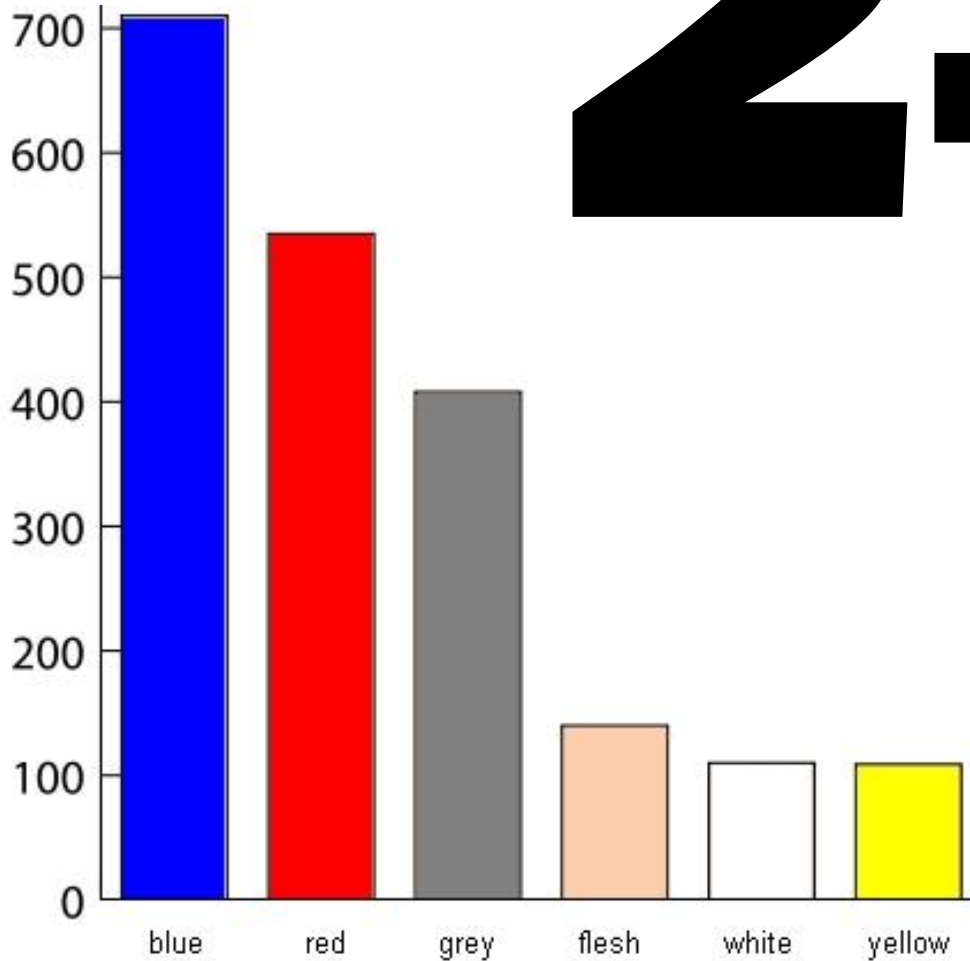
**A little
stats
never hurt
anyone**

Σ 0

1st



**Pie
Charts
and Bar
Graphs
aren't the
only game
in town**



2nd

**Not
all
data
are
numbers**

3rd

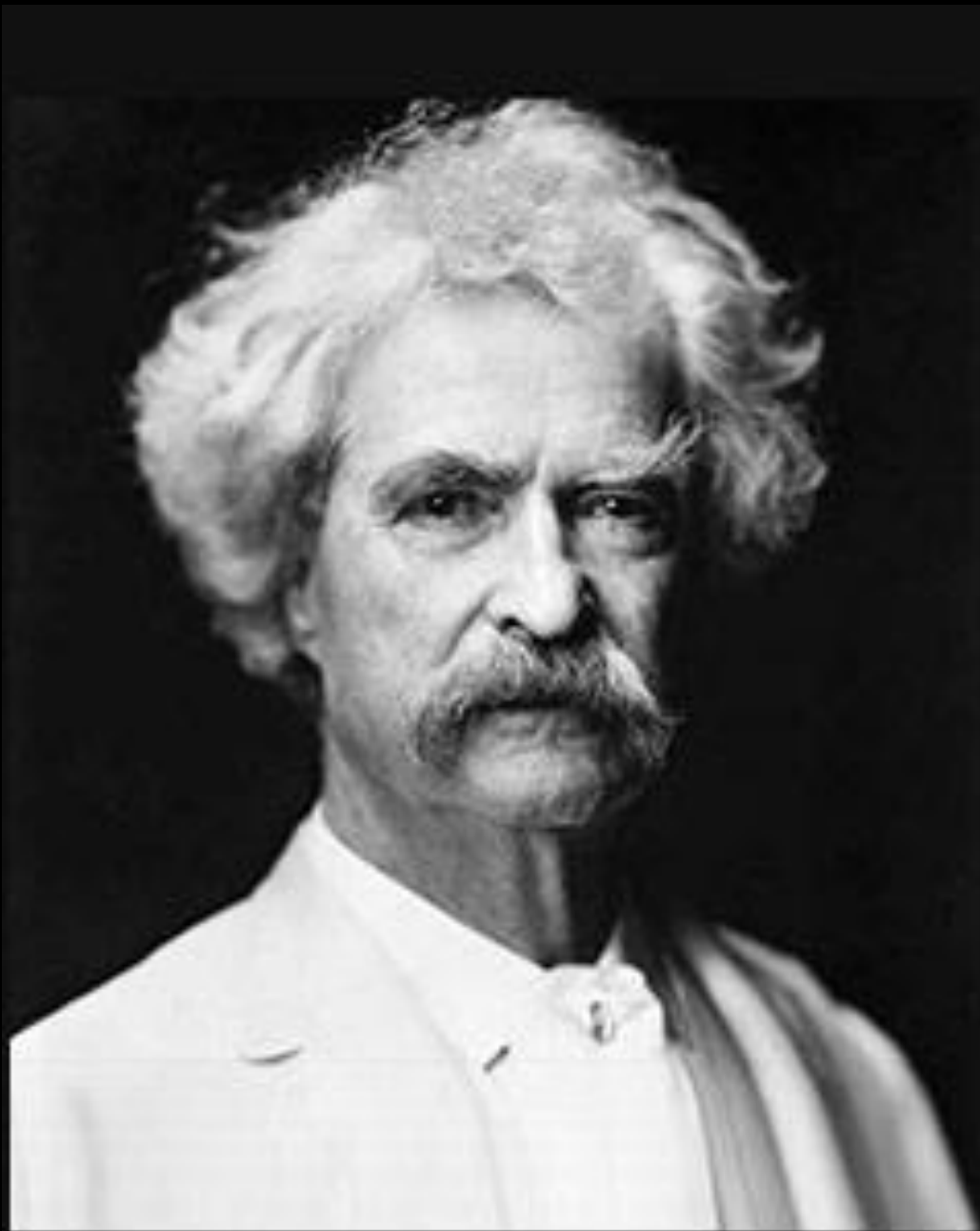
Collecting and
finding
patterns in
data is
important,
interesting,
and easier with
technology.

4th

**A little
stats
never hurt
anyone**

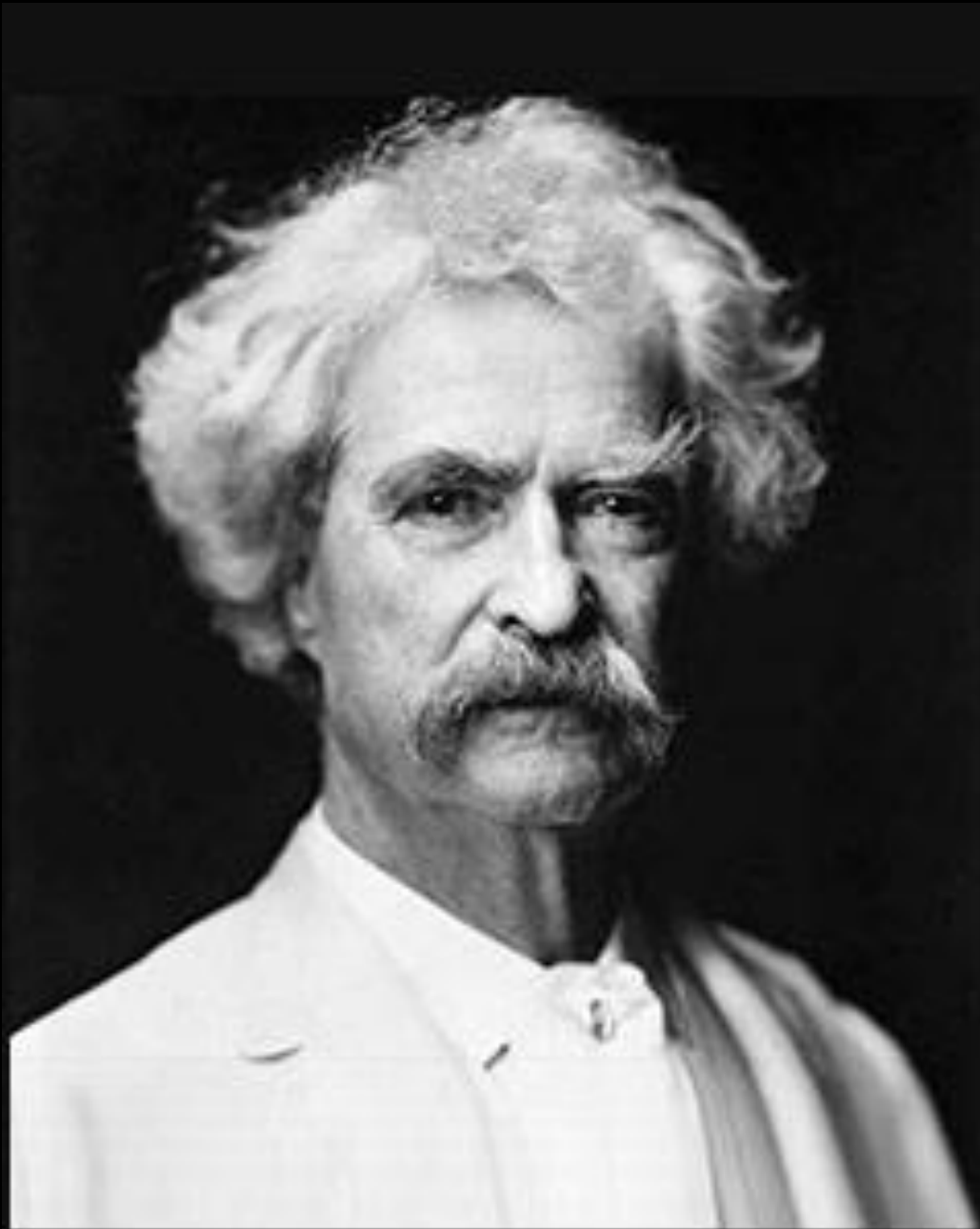
1st

correlations



“There are
three kinds of
lies: lies,
damned lies,
and
statistics.”

- Mark Twain



“It’s easier to
fool people
than to
convince them
that they have
been fooled.”

- Attributed to Mark Twain

Toasters Don't Kill People...Bread Does

I've done a little research, and what I've discovered should make anyone think twice....

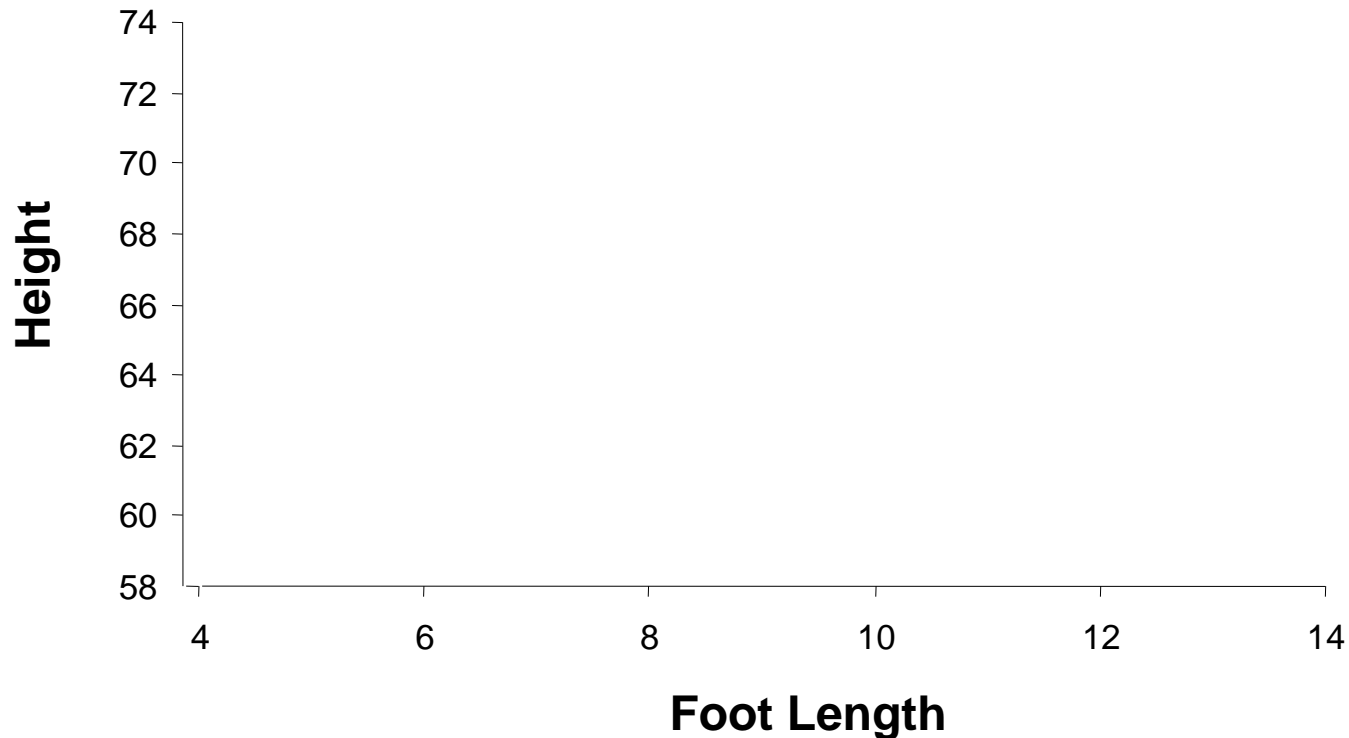
- More than 98% of convicted felons are bread users.
- Fully HALF of all children who grow up in bread-consuming households score below average on standardized tests.
- More than 90 percent of violent crimes are committed within 24 hours of eating bread.
- Bread is made from a substance called “dough.” It has been proven that as little as one pound of dough can be used to suffocate a mouse. The average American eats more bread than that in one month!
- Bread has been proven to be addictive. Subjects deprived of bread and given only water to eat begged for bread after as little as two days.
- Bread is often a “gateway” food item, leading the user to “harder” items such as butter, jelly, peanut butter, and even cold cuts.

- Bread has been proven to absorb water. Since the human body is more than 90 percent water, it follows that eating bread could lead to your body being taken over by this absorptive food product, turning you into a soggy, gooey bread-pudding person.
- Bread is baked at temperatures as high as 400 degrees Fahrenheit! That kind of heat can kill an adult in less than one minute.
- Most American bread eaters are utterly unable to distinguish between significant scientific fact and meaningless statistical babbling.

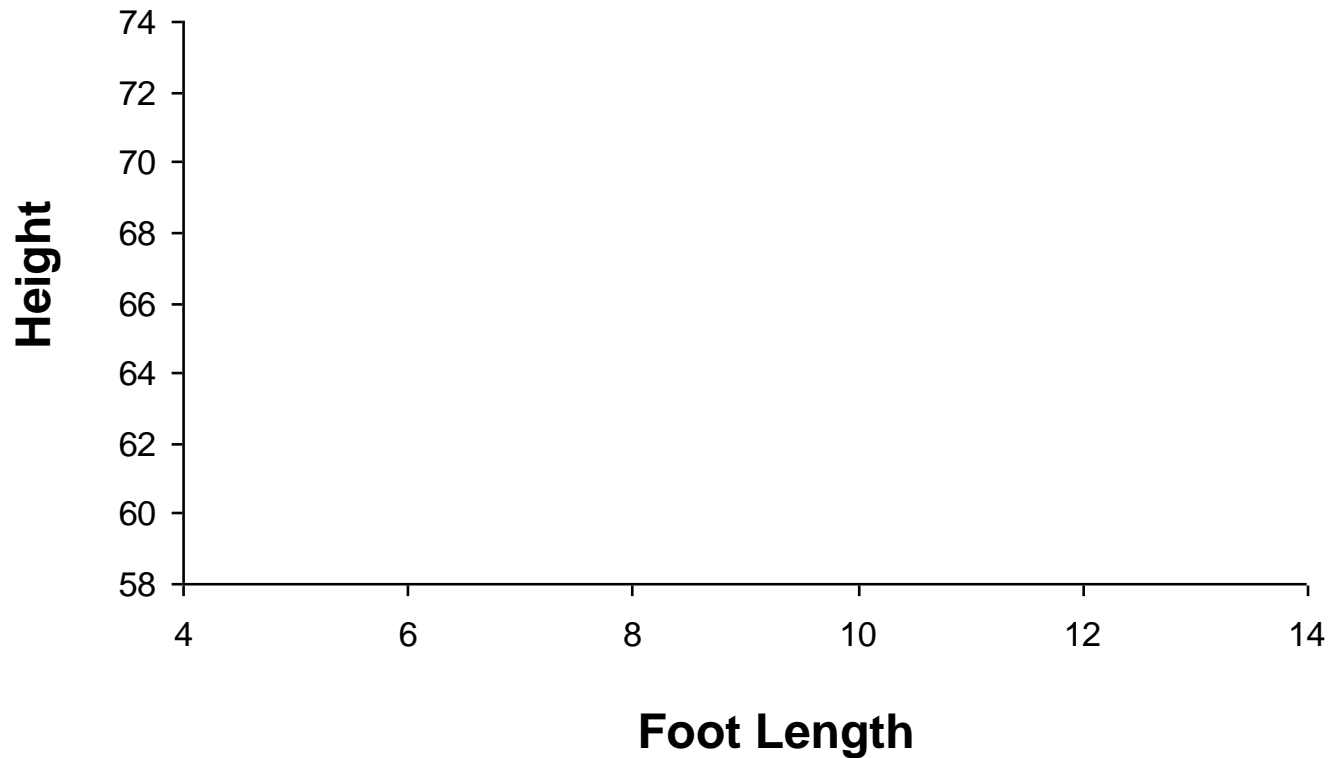


Suppose we wished to graph the relationship between foot length and height of 20 subjects.

In order to create the graph, which is called a scatterplot or scattergram, we need the foot length and height for each of our subjects.

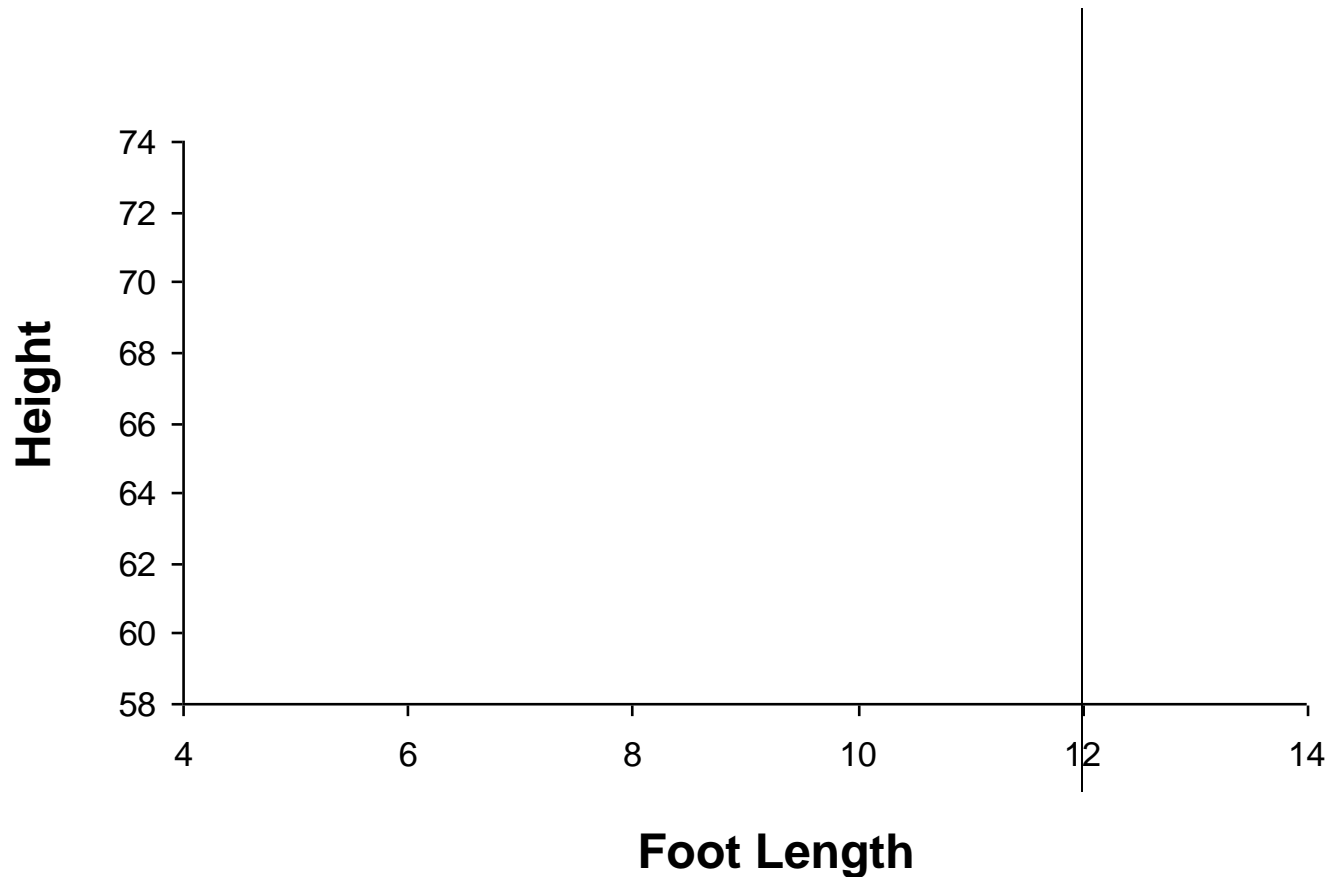


Assume our first subject had a 12 inch foot and was 70 inches tall.



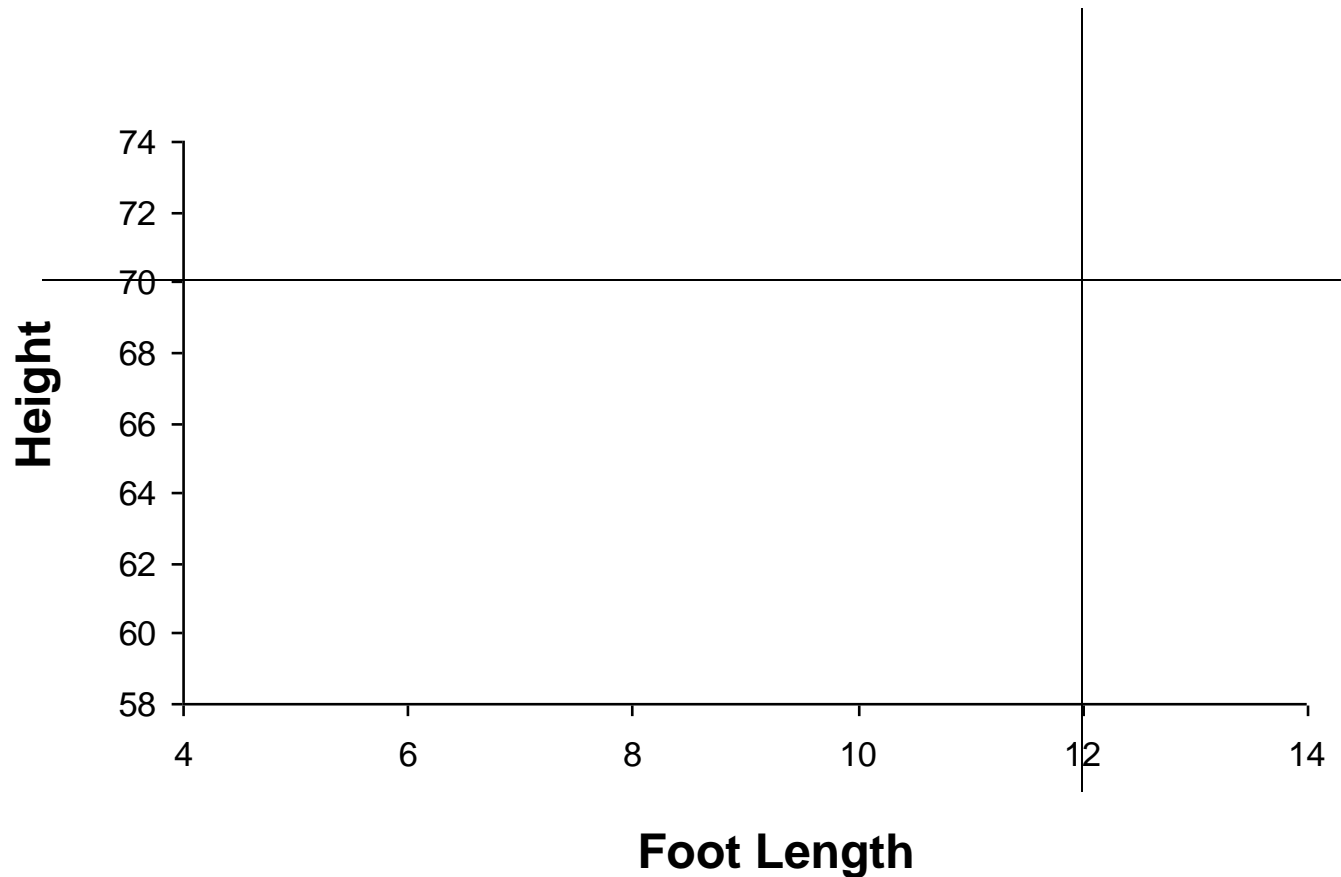
Assume our first subject had a 12 inch foot and was 70 inches tall.

1. Find 12 inches on the x-axis.



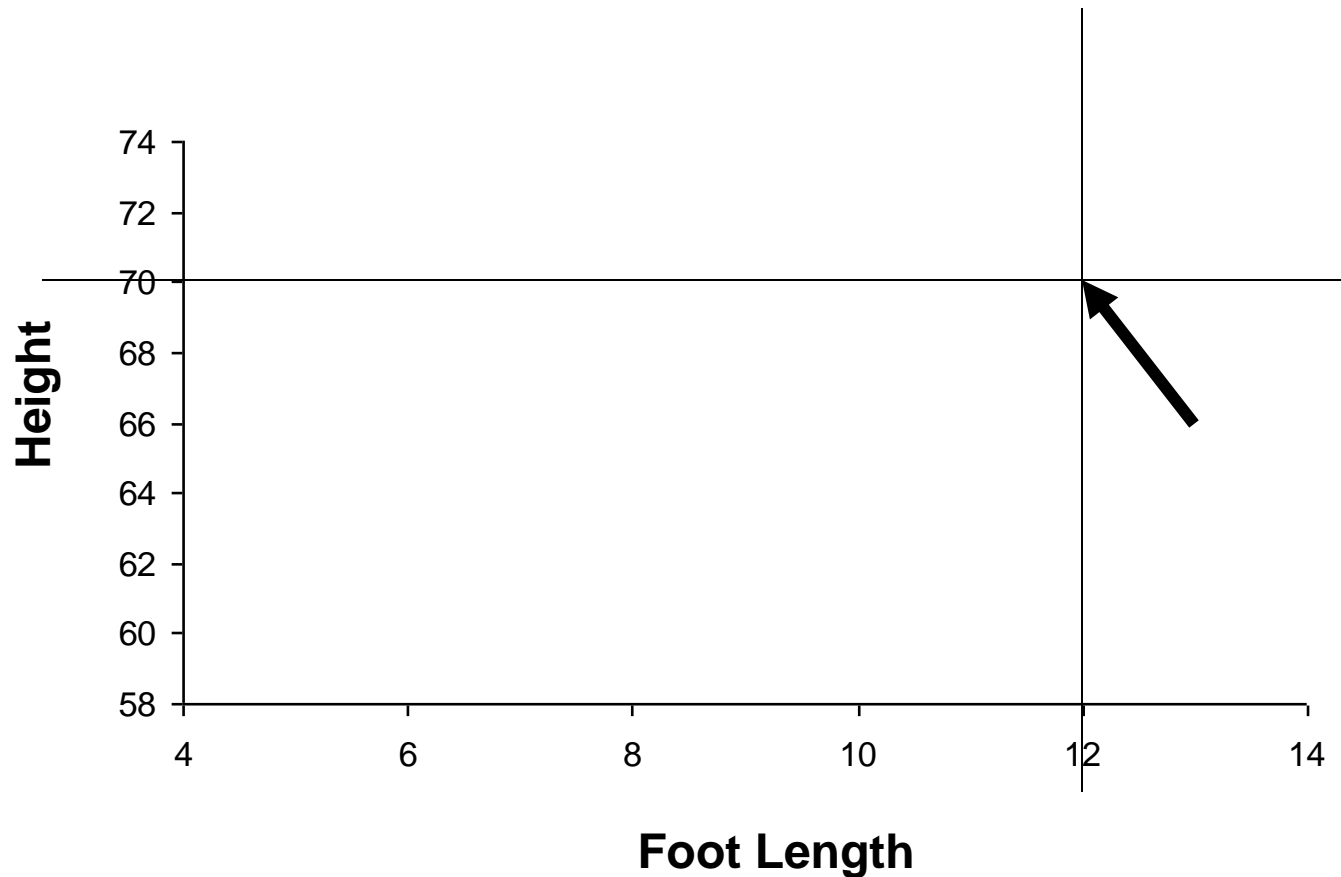
Assume our first subject had a 12 inch foot and was 70 inches tall.

1. Find 12 inches on the x-axis.
2. Find 70 inches on the y-axis.



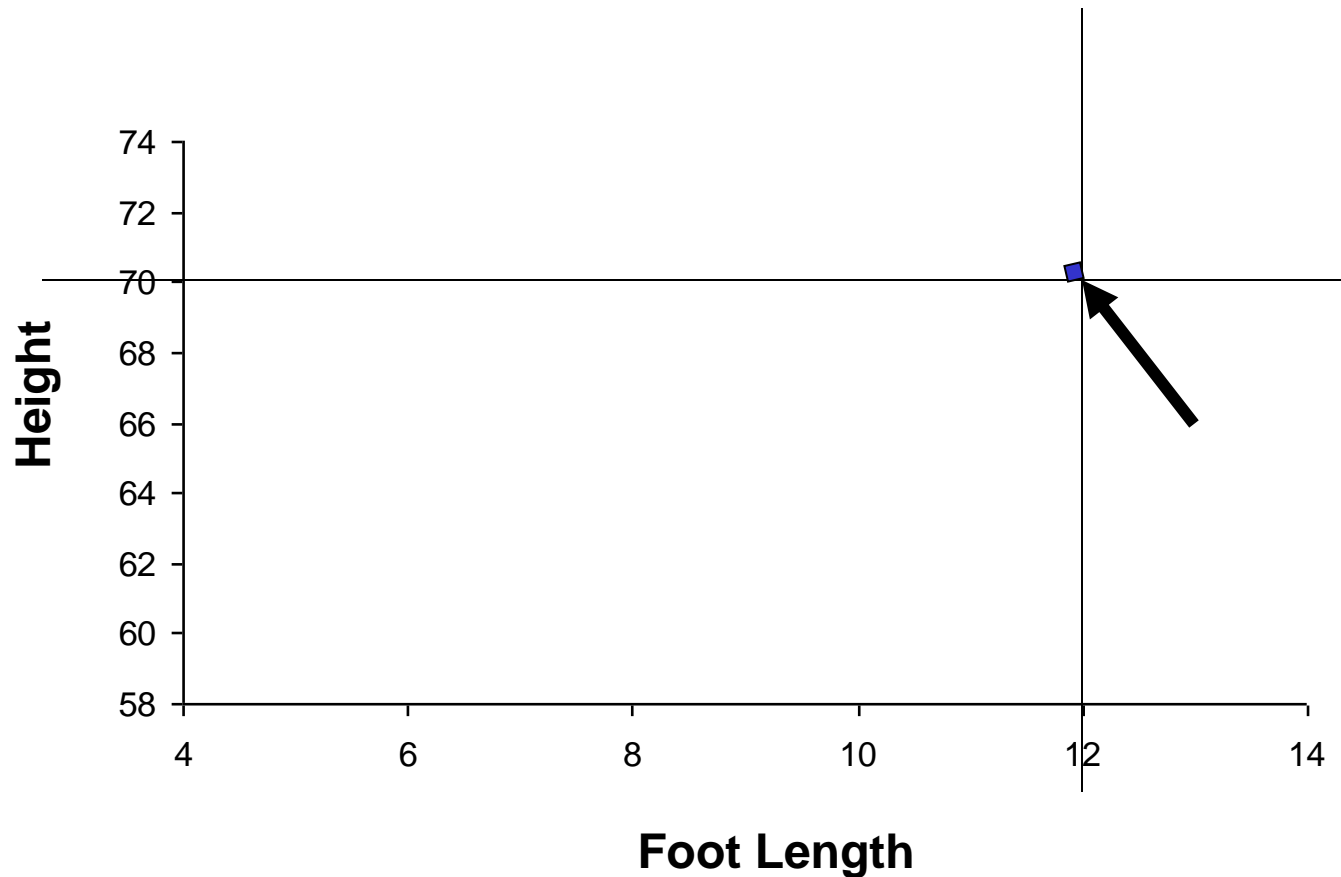
Assume our first subject had a 12 inch foot and was 70 inches tall.

1. Find 12 inches on the x-axis.
2. Find 70 inches on the y-axis.
3. Locate the intersection of 12 and 70.



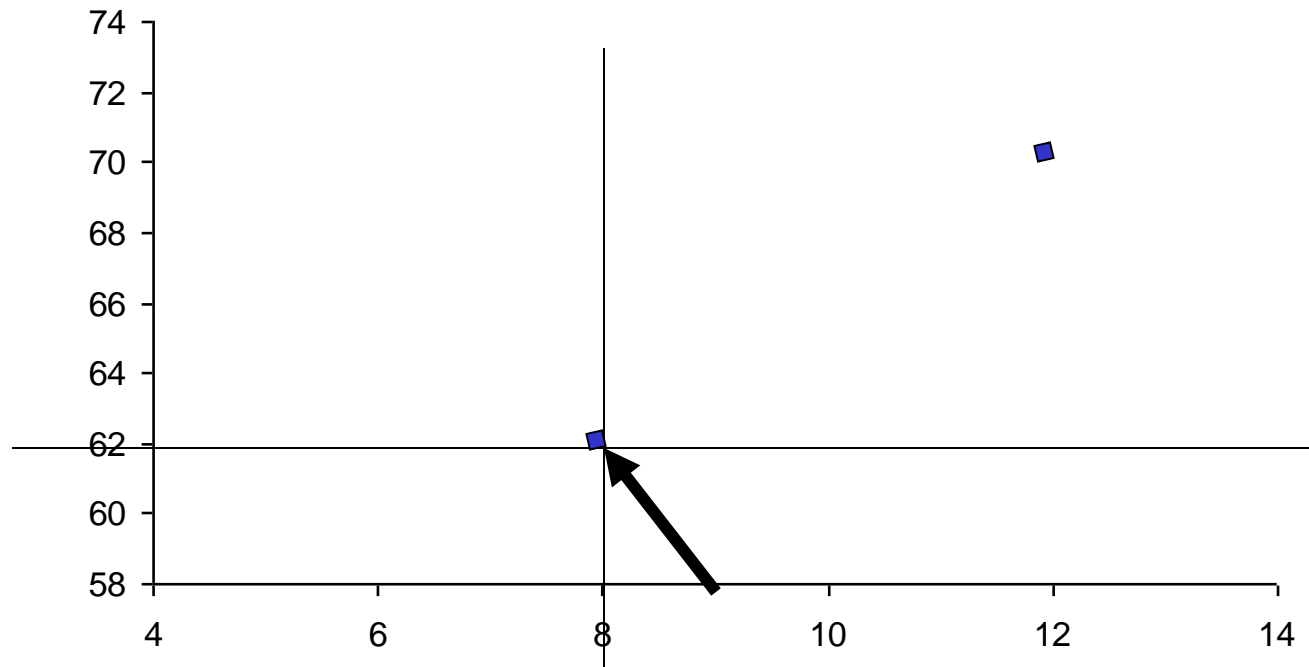
Assume our first subject had a 12 inch foot and was 70 inches tall.

1. Find 12 inches on the x-axis.
2. Find 70 inches on the y-axis.
3. Locate the intersection of 12 and 70.
4. Place a dot at the intersection of 12 and 70.



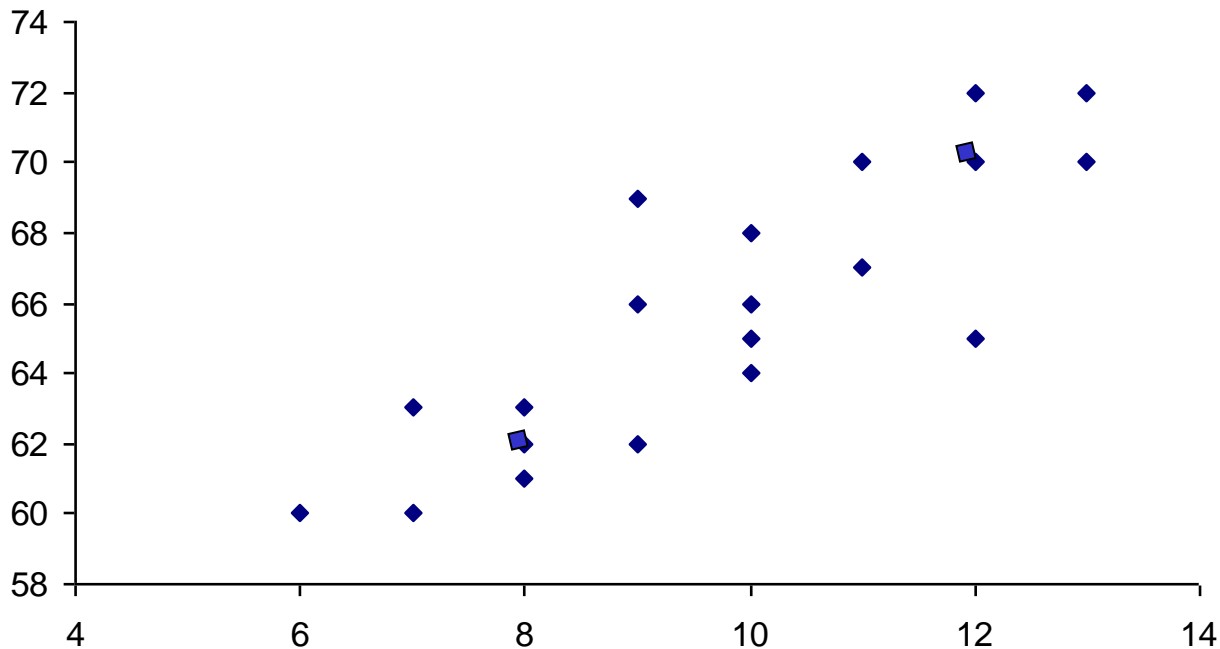
Assume that our second subject had an 8 inch foot and was 62 inches tall.

5. Find 8 inches on the x-axis.
6. Find 62 inches on the y-axis.
7. Locate the intersection of 8 and 62.
8. Place a dot at the intersection of 8 and 62.

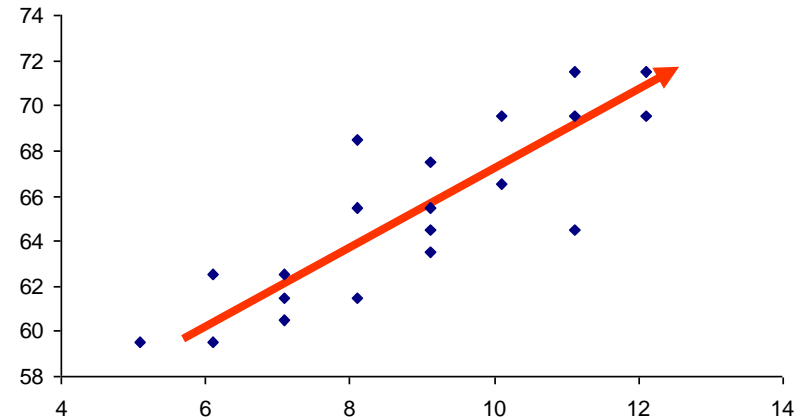


Assume that our second subject had an 8 inch foot and was 62 inches tall.

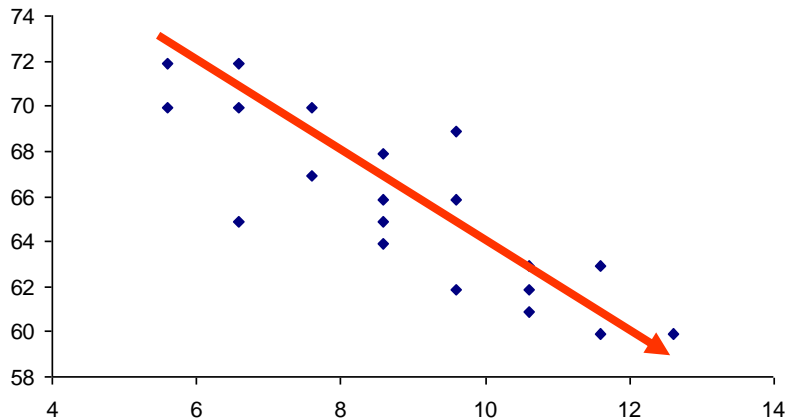
5. Find 8 inches on the x-axis.
6. Find 62 inches on the y-axis.
7. Locate the intersection of 8 and 62.
8. Place a dot at the intersection of 8 and 62.
9. Continue to plot points for each pair of scores.



If the points on the scatterplot have an upward movement from left to right, we say the relationship between the variables is positive.



If the points on the scatterplot have a downward movement from left to right, we say the relationship between the variables is negative.

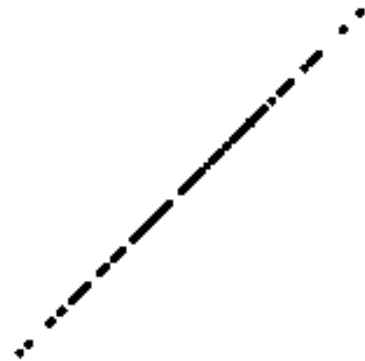


Not only do relationships have direction (positive and negative), they also have strength (from 0.00 to 1.00 and from 0.00 to -1.00).

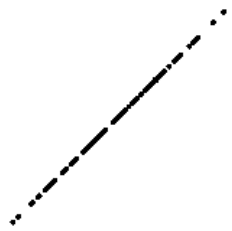
The more closely the points cluster toward a straight line, the stronger the relationship is.



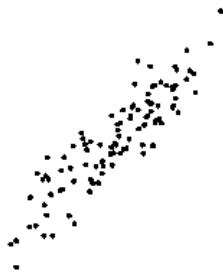
$r = 0.00$



$r = 1.00$



$r = 1.00$



$r = 0.90$



$r = 0.80$



$r = 0.70$



$r = 0.60$



$r = 0.50$



$r = 0.40$



$r = 0.30$

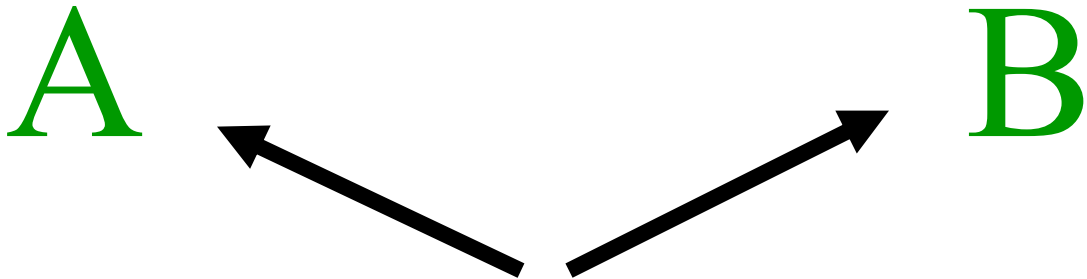


$r = 0.20$



$r = 0.10$

**Correlation is a necessary, but not sufficient,
condition for determining causality.**



<http://www.gapminder.org>

GAPMINDER

a fact-based worldview

GAPMINDER WORLD

VIDEOS

DOWNLOADS

TEACH

IGNORANCE

DATA



Refresh your world

Pour the sparkling fresh numbers into your eyes and upgrade your worldview.

EXAMPLES:

- Wealth & Health of Nations ▶
- CO₂ emissions since 1820 ▶
- Africa is not a country! ▶
- Is child mortality falling? ▶
- Where is HIV decreasing? ▶

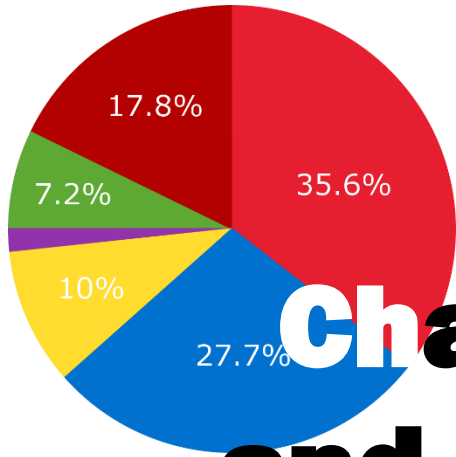
BUBBLE CHART ▶



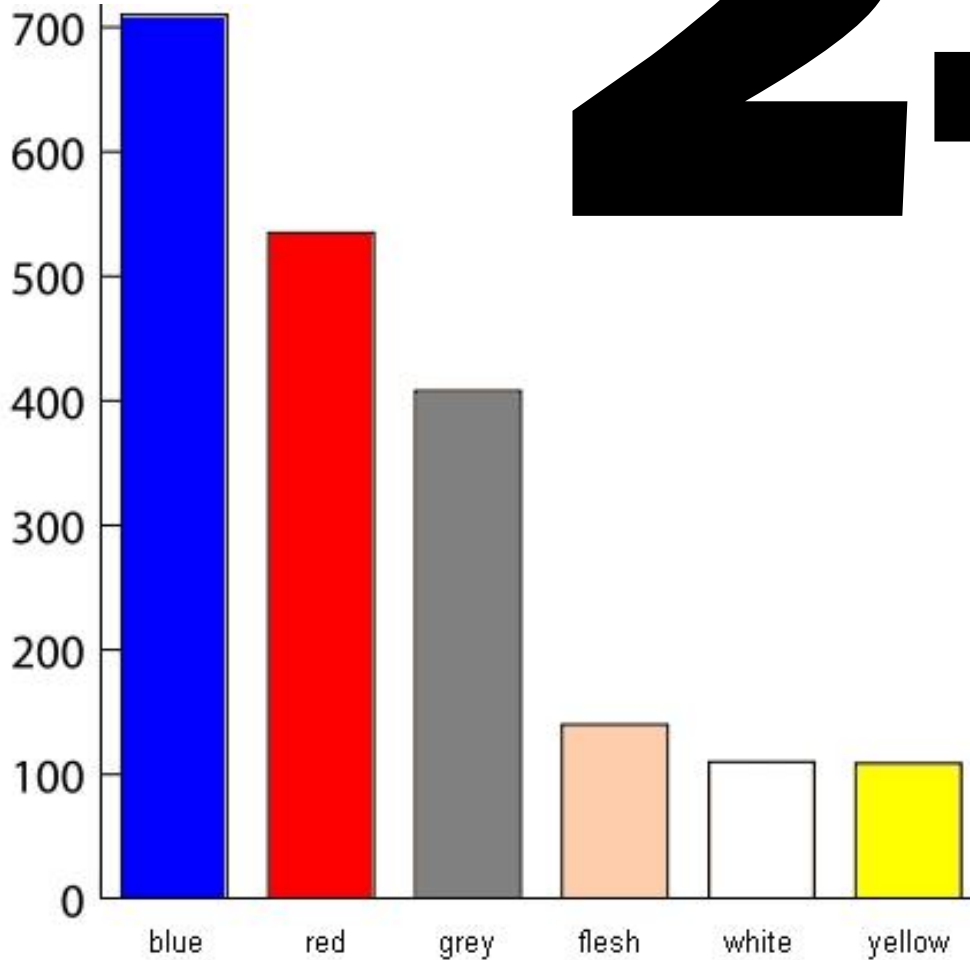
The following table is adapted from Doll and shows per-capita consumption of cigarettes in various countries in 1930, and the death rates from lung cancer for men in 1950.

Country	Cigarette Consumption	Death per million
Australia	480	180
Canada	500	150
Denmark	380	170
Finland	1100	350
Great Britain	1100	460
Holland	490	240
Iceland	230	60
Norway	250	90
Sweden	300	110
Switzerland	510	250
USA	1300	200

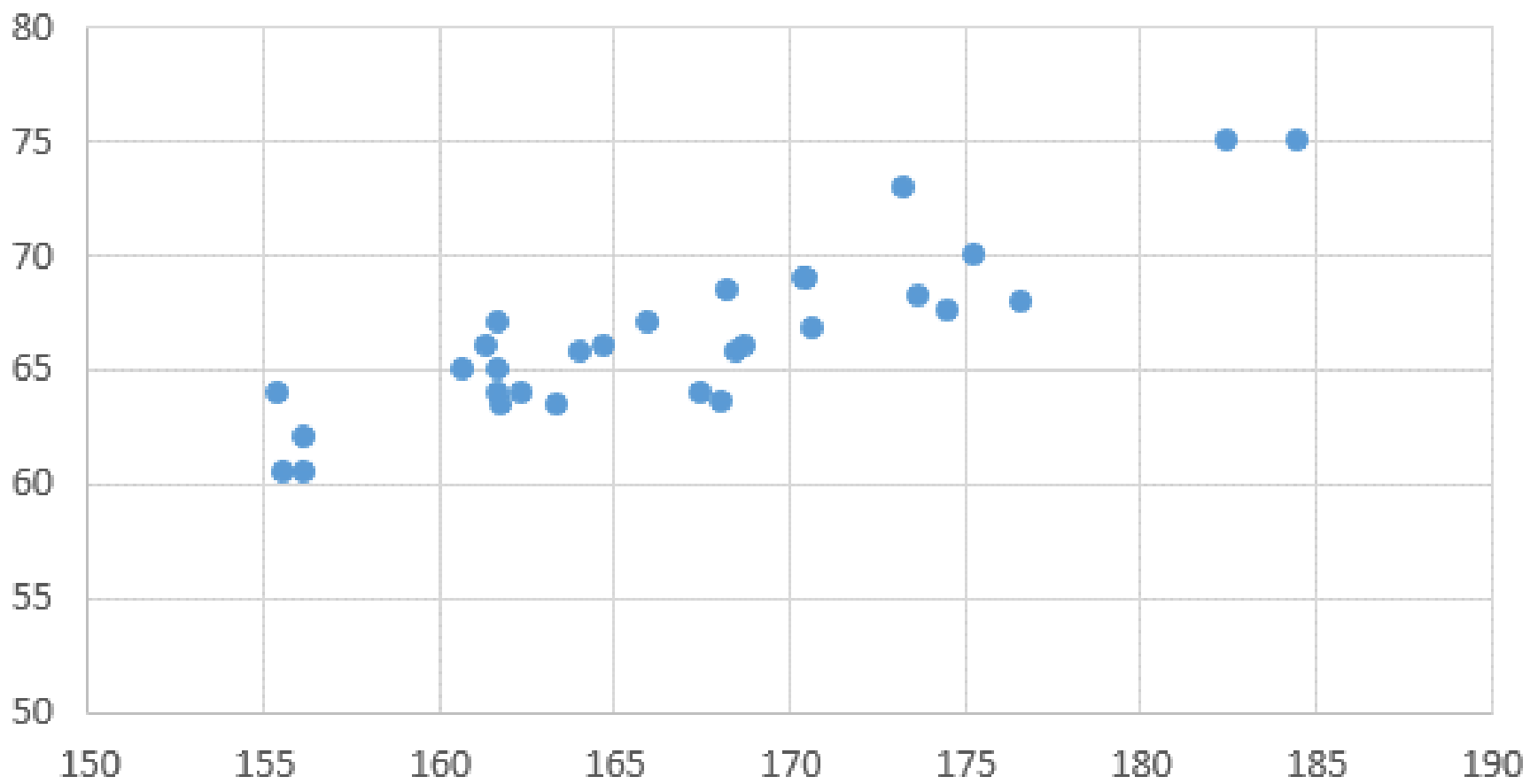
https://docs.google.com/spreadsheets/d/10XKc6zLMm_bdv5tfzjnCc0GHbNE9gRR8f2gCXa64jx8/edit#gid=0



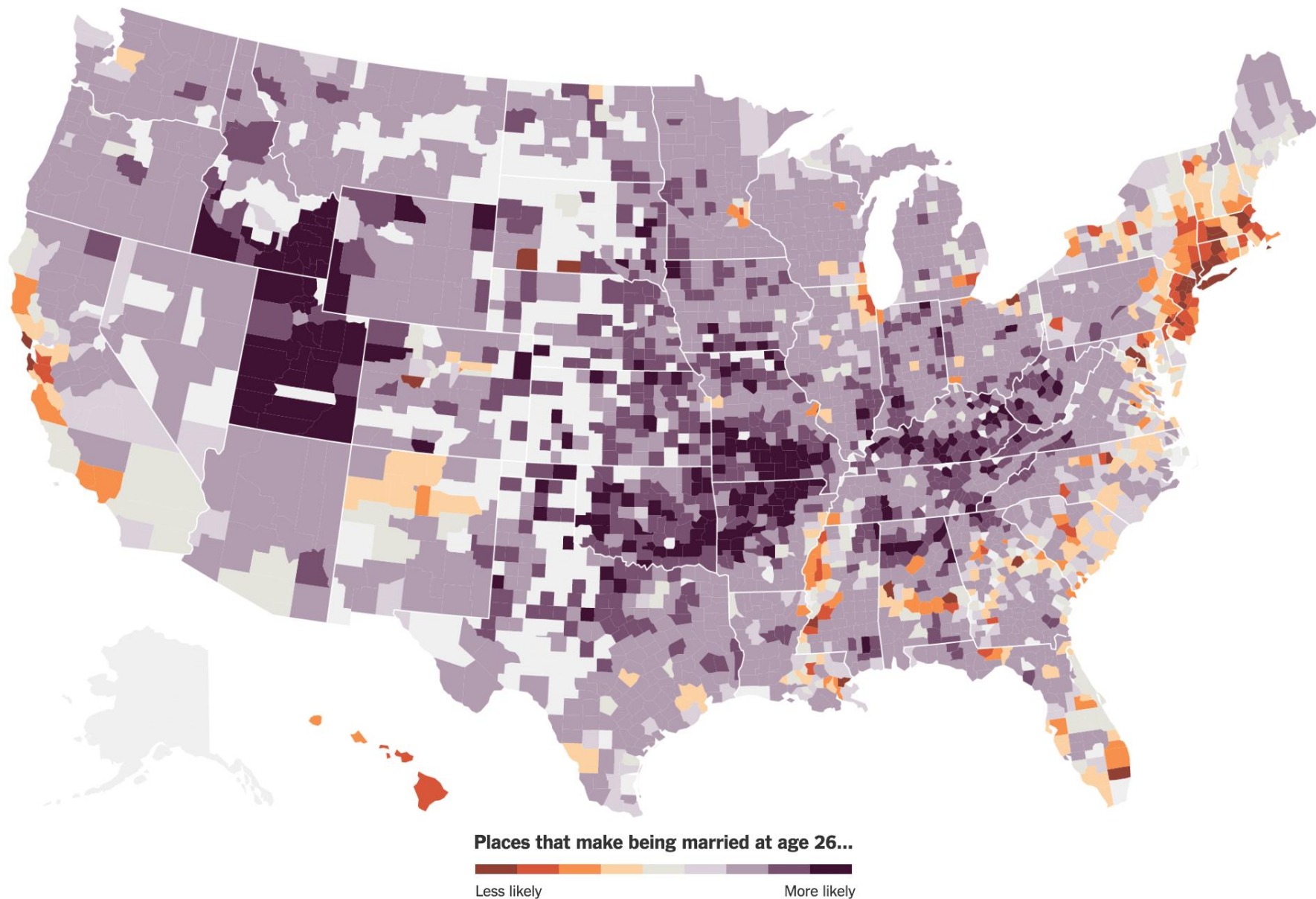
**Pie
Charts
and Bar
Graphs
aren't the
only game
in town**



2nd



Growing up in some places — especially liberal ones — makes people less likely to marry, new data shows.



The Thanksgiving Recipes Googled in Every State

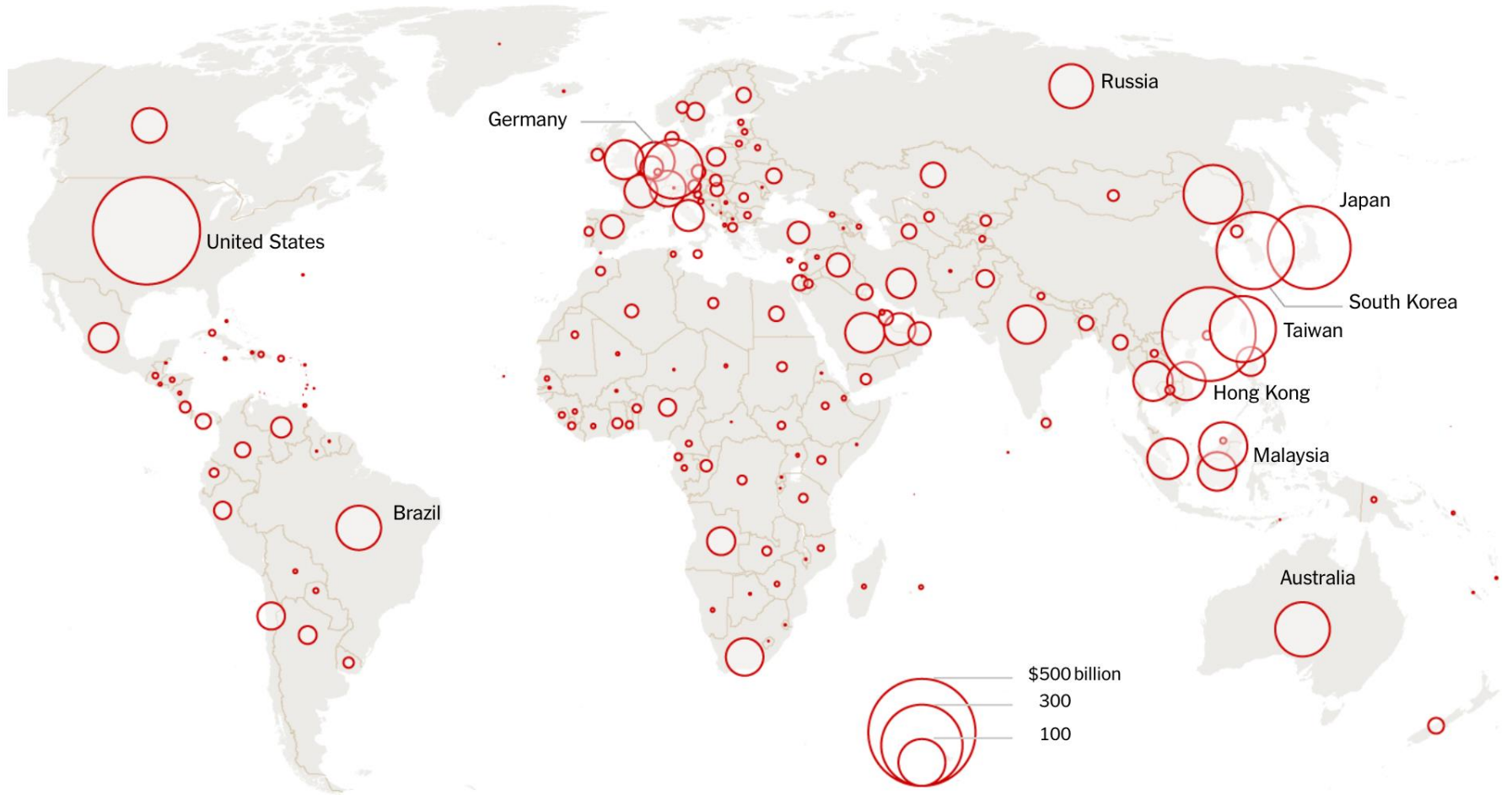
By THE UPSHOT STAFF NOV. 25, 2014

Which foods are unusually popular in each state on Thanksgiving.



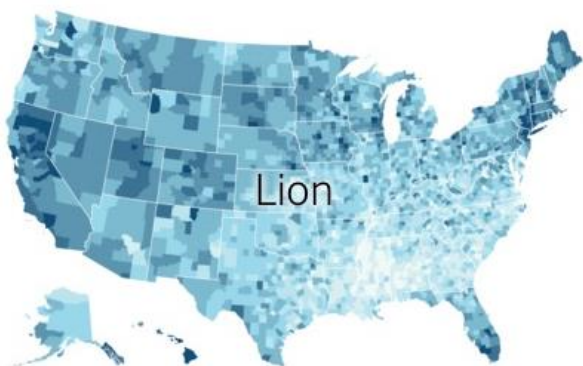
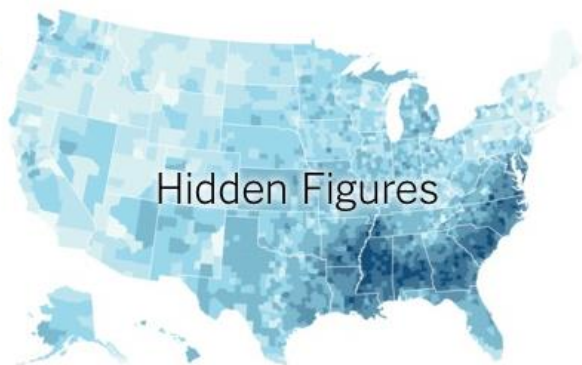
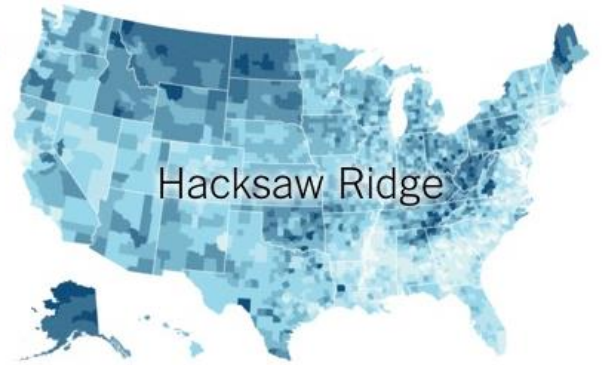
China's 2013 trade with each country

Total value of imports plus exports



China's exports and imports to:

	United States	Hong Kong	Japan	South Korea	Taiwan	Germany	Australia	Malaysia	Brazil	Russia
EXPORTS	\$368 bil.	\$385	\$150	\$91	\$41	\$67	\$38	\$46	\$36	\$50





Living Earth - Clock & Weather 4+

Radiantlabs, LLC >

★★★★★ (156)



OPEN

- Details
- Reviews
- Related



**Not
all
data
are
numbers**

3rd





<https://www.youtube.com/watch?v=vvsAvvKeGhc>
<https://www.gapminder.org/dollar-street/>

Search



Donate

Resources

About

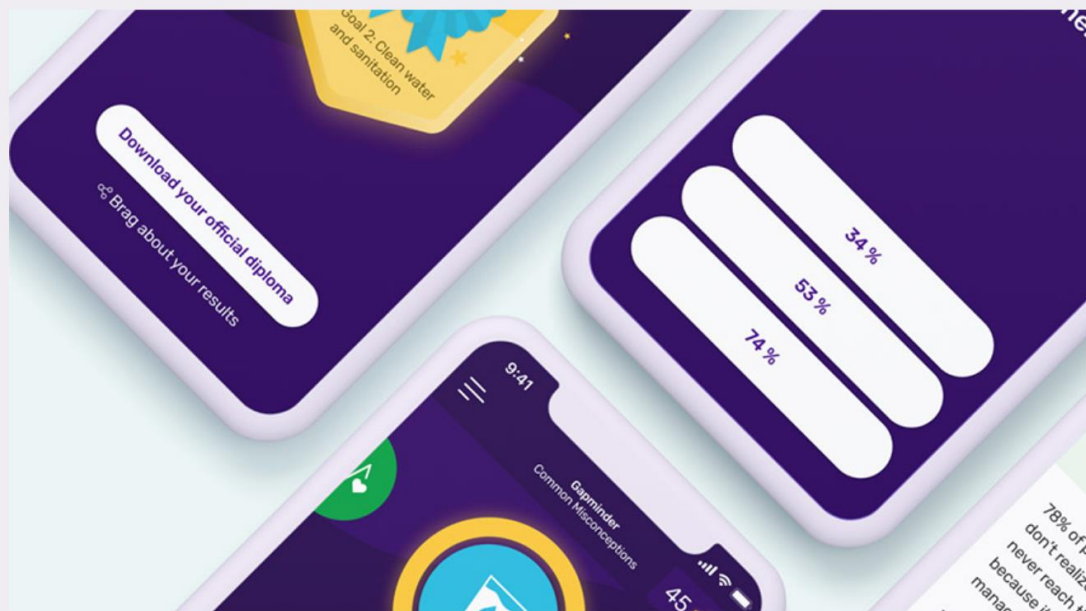
a fact-based worldview

Used by thousands of teachers all over the world.

Worldview Upgrader

Rid yourself of the most common global misconceptions and get your Upgraded Worldview Certificate

[Find your misconceptions](#)



Collecting and
finding
patterns in
data is
important,
interesting,
and easier with
technology.

4th

[← Search](#)



Post-it®

Brainstorm. Capture. Share.



4.0 ★★★★★

300 Ratings

4+

Age

What's New

[Version History](#)

Version 3.3

4d ago

Minor bug fixes and improvements.

Preview

<https://www.plickers.com>



Plickers is a powerfully simple tool that lets teachers collect real-time formative assessment data without the need for student devices



Tailor instruction with instant feedback

Use Plickers for quick checks for understanding to know whether your students are understanding big concepts and mastering key skills.

"Seeing responses like these on @plickers quizzes let[s] me know I can