## Research is More than GO glling:

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http://researchbasics.education.uconn.edu

## What technology does

 for gifted kids....1. Removes information resource barriers
2. Creates opportunities for students to explore disciplines through authentic methodologies and products
3. Encourages creativity and questioning by providing opportunities for "What if"scenarios

## Technology use

 in the classroom has progressed through 3 distinct stages.
## Automated Print

IIII

## Automated Print Production Tool

## Automated Print Production Tool Data Driven Decision Making

## WHAT IS REAL RESEARCH?



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



## The Research Process


...our goal is to allow students to construct knowledge by providing them with opportunities to 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.

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The Research Process Helps Students...




Critically Evaluate Reseaich.Findings

# 140,000-190,000 

1.5 millon

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2 x
$$




- 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 ${ }_{\text {(siephens.andidowit, 2013) }}$



## A little stats never hurt anyone <br> 



## Not

## 8]

cata

are
numbers

## Collecting and

 finding patternsin data isimportant, interesting? and easier with technology.

## A little stats never hurt anyone <br> 

## eorprelations




## "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

l've done a little research, and what l'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.


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1. Find 12 inches on the $x$-axis.


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2. Find 70 inches on the $y$-axis.


Foot Length

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.


Foot Length

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.


Foot Length

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.

$r=0.00$
$r=1.00$

$$
r=1.00 \quad r=0.90 \quad r=0.80 \quad r=0.70 \quad r=0.60
$$

$$
r=0.50 \quad r=0.40 \quad r=0.30 \quad r=0.20 \quad r=0.10
$$

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



## http://www.gapminder.org


a fact-based worldview


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

EXAMPLES:

Wealth \& Health of Nations *
$\mathrm{CO}_{2}$ 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 <br> Consumption | Death per <br> 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 |




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


Places that make being married at age 26...

## 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 exports and imports to:



Here's a map of the country, with each state sized by its number of electoral votes and shaded by the leading candidate's chance of winning it.

$50 \% 60$
70
90
KEY CLINTON'S CHANCES
TRUMP'S CHANCES

## Not

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numbers

## Historical R E S E A R C H

* Primary sources are those in which the author was a direct observer of the recorded event * Secondary sources are those in which the author is reporting observations of others


## http://chroniclingamerica.loc.gov




## DOLLAR STREET

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

## Collecting anc

 ffinding patterns in data isimportant, interesting, and easier with technology:


## 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

Downioad on the
App Store


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.

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https://pollev.com/delsiegle348

Radiantlabs, LLC >

${ }^{+}$OPEN

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LIVING EARTH World Clock, Weather, and Stunning Live 3D Earth


## Description

* Chosen by Apple as the best iPhone and iPad Utility in App Store Rewind *
*Named by New York Times as a Top 10 iPad App *

Enjoy a stunning live 3D simulation of our planet with global weather, forecasts and world clock for cities around the world. View live global cloud patterns, hurricanes and tropical storms. Explore and experience amazi... more

## https://create.kahoot.it

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## HEY DELSIEGLE!

Welcome to Kahoot! Here are some good starting points:
() Play our intro quiz or find a public Kahoot

Watch intro video!
I Create your first Kahoot below (it's quick and easy!)

- It's more fun with others! Share on Facebook Twitter or by email


## Create new Kahoot!



NEW! Find out how to play your kahoots again in 'Ghost Mode'!

```
MY STATS e
5
kahOOTS QUESTIONS PLAYS PLAYERS SHARES
    1
    FAVS
```

MY RECENT RESULTS

| 29th Jul | 00:14 Edufest | 46 |
| :---: | :---: | :---: |
| 15th Jul | 10:47 Confratute 2014 | 4 4 |
| 14th Jul | 21:33 Dog | ¢ 4 : |
| 14ith Jui | 20:43 Confratute 2014 | 4 4 \% |

All results

## COMMUNITY

tips on our blogJOIN OUR FACEBOOK COMMUNITYSHARE YOUR EXPERIENCES ON TWITTERSUGGEST AN IDEA OR FEATURE
#  

## Educational Research Basics by Del Siegle



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[^0]
## http://www.cetla.howard.edu/teaching resources/data.html

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(c) CETLA | Center for Excellen...
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## Center for Excellence in Teaching, Learning, and Assessment

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## Teaching Resources

Blackboard Resource Center
Software Resource Center
Multimedia Resources
Copyright
Scholarship of T\& L
Distance Learning
Teaching Evaluation
Entrepreneurship
Curriculum Design
Teaching with Digital Data
Accessibility

## TEACHING WITH DIGITAL DATA AND ARCHIVES

UNDER CONSTRUCTION


Advances in information technology have opened up new opportunities for students to use data and archives to answer real-world questions in their disciplines. On-line databases and web-based tools now allow undergraduates and even younger students to access and manipulate authentic data and artifacts without having to master sophisticated or time-consuming methods of data collection,

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[^0]:    Honors students demonstrating different sampling techniques with M and Ms

