Data Science Education
in 6-12 Classrooms:
What Shoulda Coulda Woulda,
But Often Ain't There

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RTI INTERNATIONAL

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Let' Evaluate the Evidence....

Shoulda	To show obligation
Coulda	To suggest a possibility
Woulda	To suggest conditions
Ain't	To state what is not

Shoulda (the obligation)

Prepare data literate citizens

And

Inspire the use of data for good

And

Motivate future studies in data-intensive careers

Shoulda...in the curriculum

SCIENCE: Analyze and interpret data

LITERACY: Evaluate the **hypotheses, data, analysis, and conclusions** in a science or technical text, **verifying the data** when possible

SOCIAL SCIENCES: Define and **frame questions about events and the world in which we live, and evaluate evidence...**

MATHEMATICS: Make **inferences and justify conclusions**

COMPUTATIONAL THINKING: leverage the power of technological methods to develop and test solutions.

Data Scientists say what shoulda...

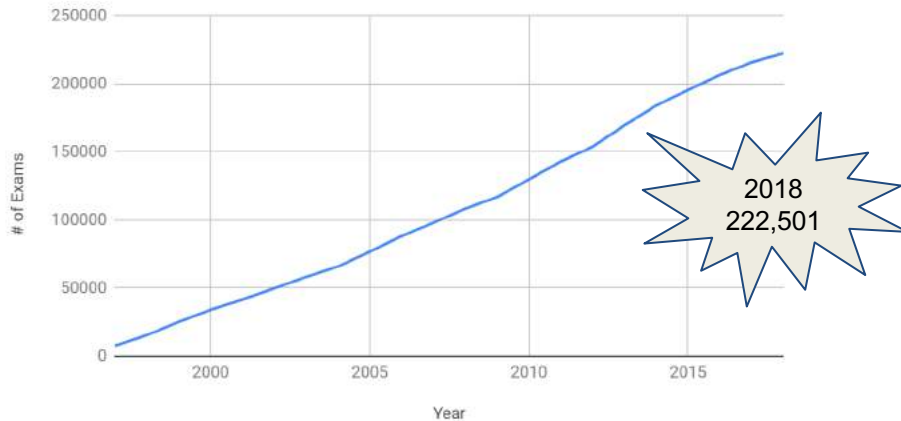Computer programming and statistics important to learn

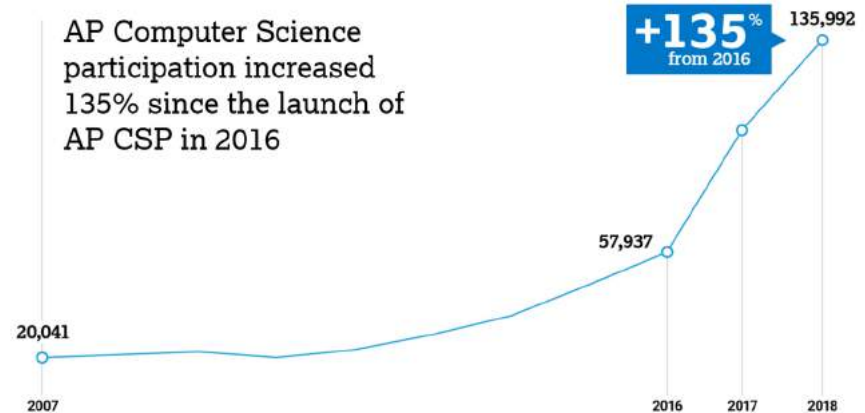But also opportunities to develop creativity and resilience in tackling open ended problems with data

Coulda (the possibilities)

Interest in AP Statistics and AP Computer Science

# of AP Statistics Exams 1997-2018

2018
222,501

AP Computer Science participation increased 135% since the launch of AP CSP in 2016

+135% from 2016

135,992

57,937

20,041

Coulda (the possibilities)

Computational thinking and coding is in vogue

And some states are moving towards
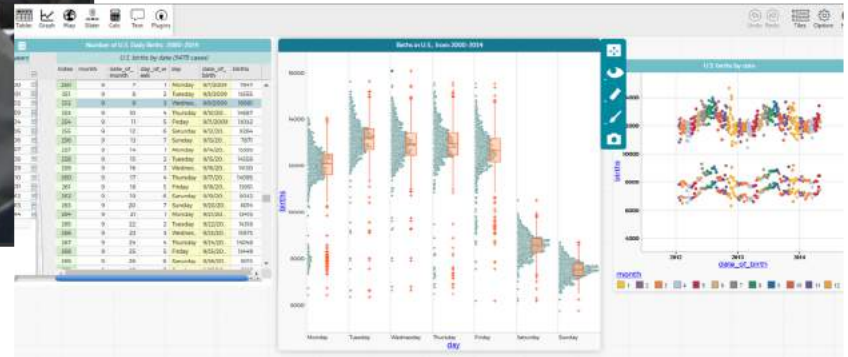licensure and more integration in curriculum

Coulda (the possibilities)

Many of us actively working to get more data investigations, data science, and computational thinking into classrooms

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Shoulda and Coulda
Get Kids Engaged and Excited with Big(ger) Data

Woulda (the conditions)

Need Resources and Understand How To use

- Data-intensive instructional activities
- Computational and visualization tools

Professional development at a large scale!

Woulda (be better prepared)

Teaching Statistics Through Data Investigations

4500+ registered

2100+ in Unit 1

800+ completed

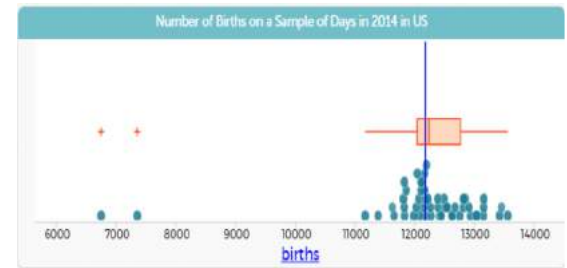Teaching Statistics Through Inferential Reasoning

Shoulda
Coulda
Woulda

But What Ain't There?

Let's evaluate the evidence

and

pick on high school and AP Statistics

Meaningful Data Investigations Ain't There

In MOST Math Classes

- 1-2 variables
- Maybe a context (but often uninteresting)
- Small data set
- Often graph by hand or with GC
- Taught "rules" for deciding to use mean or median or when to remove outliers

What about Bigger Data in AP Statistics?

Survey says....

It Ain't in AP Statistics

N=428

	None	Few	Half	Most	All
Real-world data	0%	8%	17%	62%	13%
Collected by students	3%	70%	21%	5%	1%
100 - 1000 cases	9%	51%	29%	10%	0%
>1000 cases	35%	54%	9%	0%	0%
2 - 10 variables	2%	44%	28%	23%	3%
>10 variables	46%	43%	6%	5%	0%
Multiple types of data	4%	57%	24%	12%	3%

There **Ain't** Room in AP Statistics for Big Data or Technology Other than Graphing Calculators

*How many of **you** have used a graphing calculator recently to engage in statistics or data science?*

We need to invest together in the
SHOULDA COULDA WOULDAs

To eliminate the **Ain'ts**