How big data, jagged edges, and a little dog provoke action that matters

Lower Hudson Regional Information Center
Technology Leadership Institute

January 19, 2018

Jan Bryan, Ed. D., VP, National Education Officer
jan.bryan@renaissance.com

RENAISSANCE®

Our mission:

"To accelerate learning for all children and adults of all ability levels and ethnic and social backgrounds, worldwide."

RENAISSANCE®

Big data, jagged edges and a little dog

1. **The Sputnik moment**
   A long ignored national crisis
2. **The Laika moment**
   But then it dawned on the world . . .
3. **Big data**
   Norma, 7th grade P. E., marching bands, and jagged data
4. **Small data saves Lego**
   Humanizing data

The Sputnik moment

An event causing disruption and reaction

Image available
https://thevieweast.wordpress.com/2011/07/11/the-bluff-of-the-century-sputnik-and-the-cold-war

RENAISSANCE®

"What has long been an ignored national problem,

Sputnik has made a national crisis." (Life March 24, 1958)

- Overcrowded
- Teachers grossly underpaid
- Gone wild with electives
  - Build up their bodies with in-school lunch
- No means to advance young minds of great promise
- No general agreement on what schools should teach
- Shockingly low standards

Article and image retrieved
http://www.pbs.org/wnet/need-to-know/the-daily-need/our-sputnik-moment-then-and-now/7286

What do you see as U. S. Education's most recent (within the past decade) "Sputnik Moment?"

The Laika moment

Realization that we must rethink our focus

The Laika moment

We attached the instruments, bade her farewell,
and turned away from the launch pad . . .

and didn't look back.

Video available
https://www.youtube.com/watch?v=N3x_TSq0cVo

RENAISSANCE®

The Laika impact

But then it dawned on the world that there was no provision for Laika's return.

Video available
https://www.youtube.com/watch?v=N3x_TSq0cVo

RENAISSANCE®

And the world looked to the United States

For humanity

Recommended read from *The New Yorker*

Remembering Laika, Space Dog and Soviet Hero (Wellerstein, A. 11/03/17)

"As we humanize space, let us remember that dogs humanize us."

https://www.newyorker.com/tech/elements/remembering-laika-space-dog-and-soviet-hero

What do you see as a potential "Laika moment" in U. S. Education?

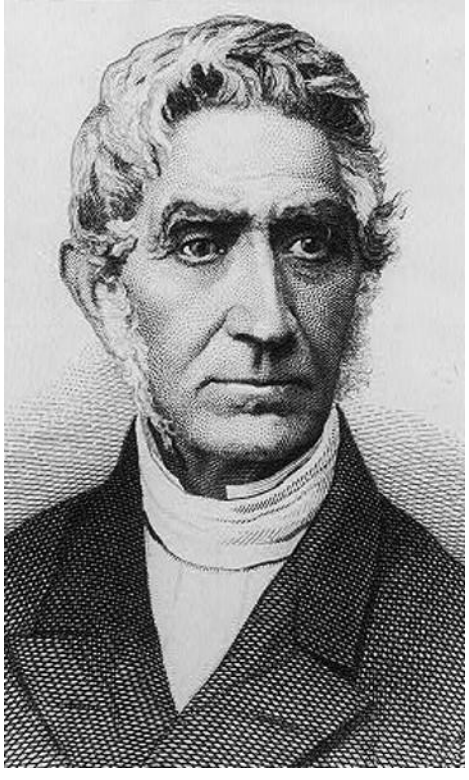
Big data (nature's ideal)

Seeking nature's ideal requires a bit of jaggedness

Image available
http://www.economist.com/node/15579717

The birth of big data

Early 19th century: An avalanche of printed numbers



- Adolphe Quetelet
  - World's first social physicist
- Governments began tabulating
- Nature's ideal

  Cosmic template for a human
- Flawed copy ∴

  Average is ideal

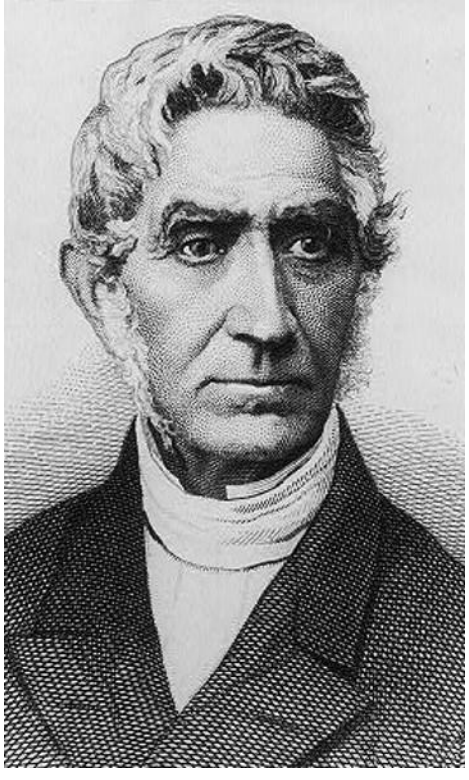
RENAISSANCE®

The birth of big data

Early 19th century: An avalanche of printed numbers

"If an individual at any given epoch of society possessed all the qualities of the Average Man, he would represent all this is great, good, or beautiful."

Adolphe Quetelet Treatise 276



Big data

Is this U. S. education's Sptunik moment?

"One thing that distinguishes schools in the United States . . .

Article and image available retrieved
https://www.washingtonpost.com/news/answer-sheet/wp/2016/05/09/big-data-was-supposed-to-fix-education-it-didnt-its-time-for-small-data/?utm_term=.09ead814df0b

These data sets, however . . .

Is this U. S. education's Sputnik moment?

- May not "spark insight about teaching and learning"
- Based on analytics rather relationships that drive learning
- Report outcomes rather than impact

Image available
http://www.kentuckyteacher.org/features/2015/07/teacher-leadership-rings-true-at-bell-elementary

Big data and the achievement variable

Is this education's Laika moment?

The academic partnership between a teacher and a learner is the dominant achievement variable in both core instruction and intervention.

Bryan, J. 2016; Coleman, Campbell, Hobson, McPartland, Mood, Weinfeld, & York, 1966; Barber & Mourshed, 2007; Chetty, Friedman, Hatti, 2013; Hilger, Saez, Schanzenbach, & Yagan, 2011; Wright, Horn, & Sanders, 1997

RENAISSANCE®

Rethinking big data

Making data actionable

"In 1952, the USAF had a problem . . ."

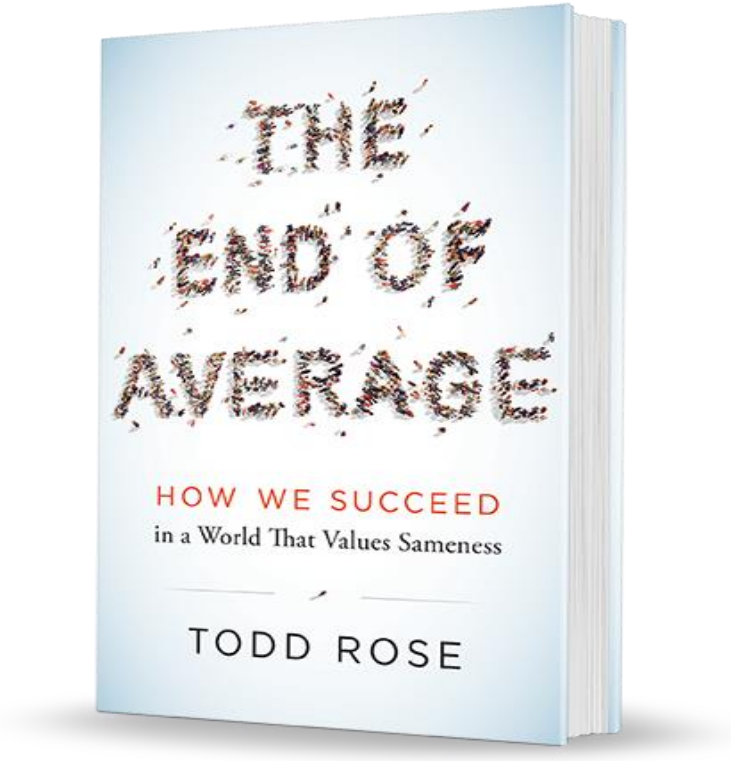
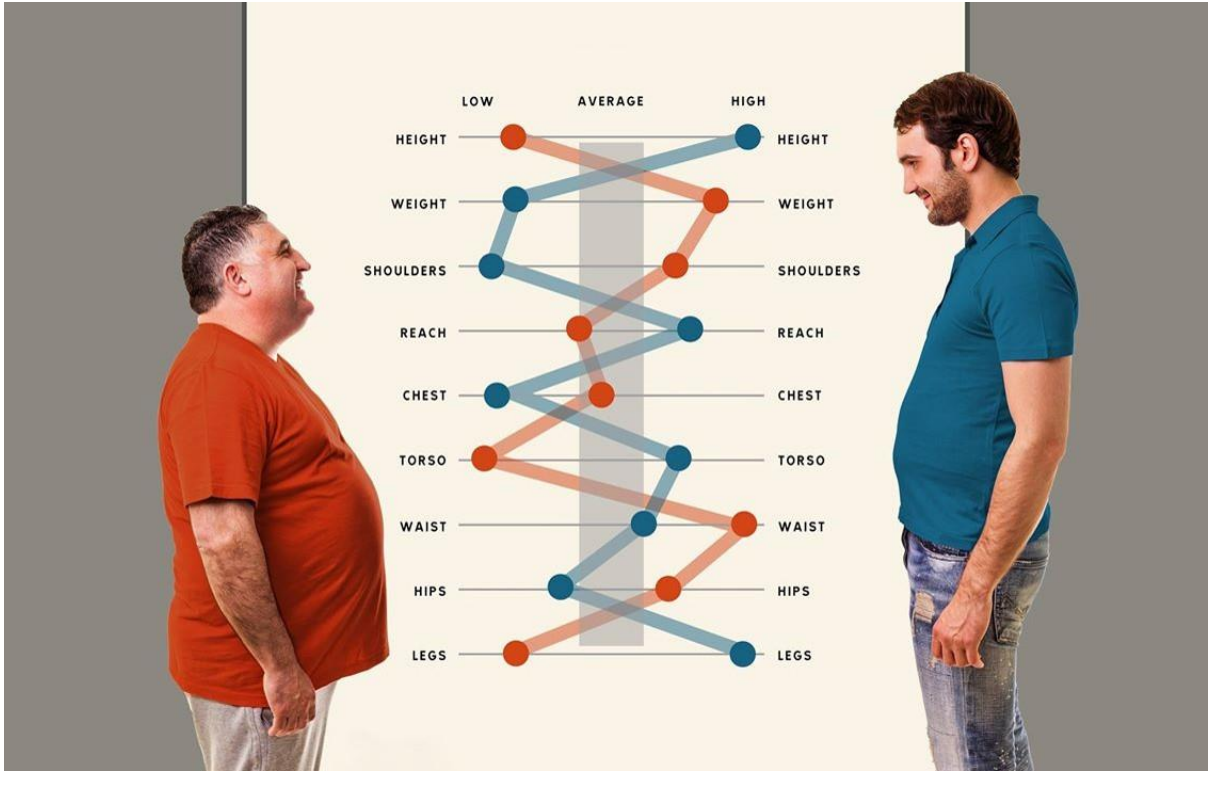


Image available
http://www.toddrose.com/endofaverage

RENAISSANCE®

Jaggedness

A new look at data



https://www.facebook.com/notes/todd-rose/nobody-is-average-heres-why/559091814254519

"*There is no such thing as an average pilot*. If you've designed a cockpit to fit the average pilot, you've actually designed it to fit no one."

Rose, T. (2015). The end of average. P. 4

Meet Norma

Like no other woman on earth!

Prior to Air Force study, Dr. Robert Dickinson . . .

- 15,000 women measured
- Greater emphasis on physical fitness
  - Impacted Physical Education and Health curricula
- Cleveland, OH held a contest
- Of the 3,864 entrants
  - ≈1% were average of 5 of 9 dimensions
- Martha Skidmore

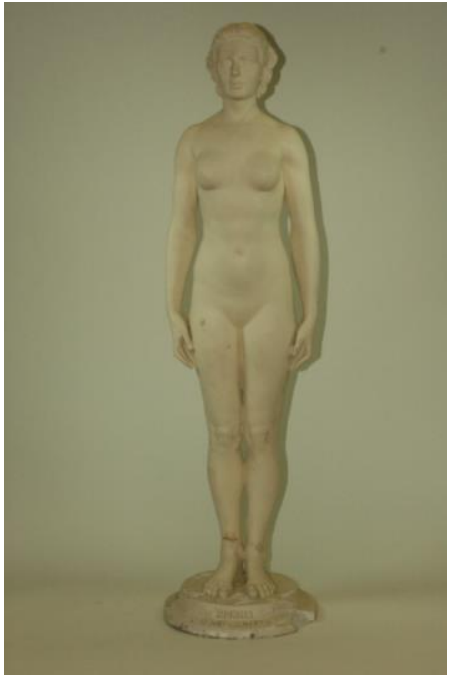


Image available
https://collections.countway.harvard.edu/onview/items/show/14383

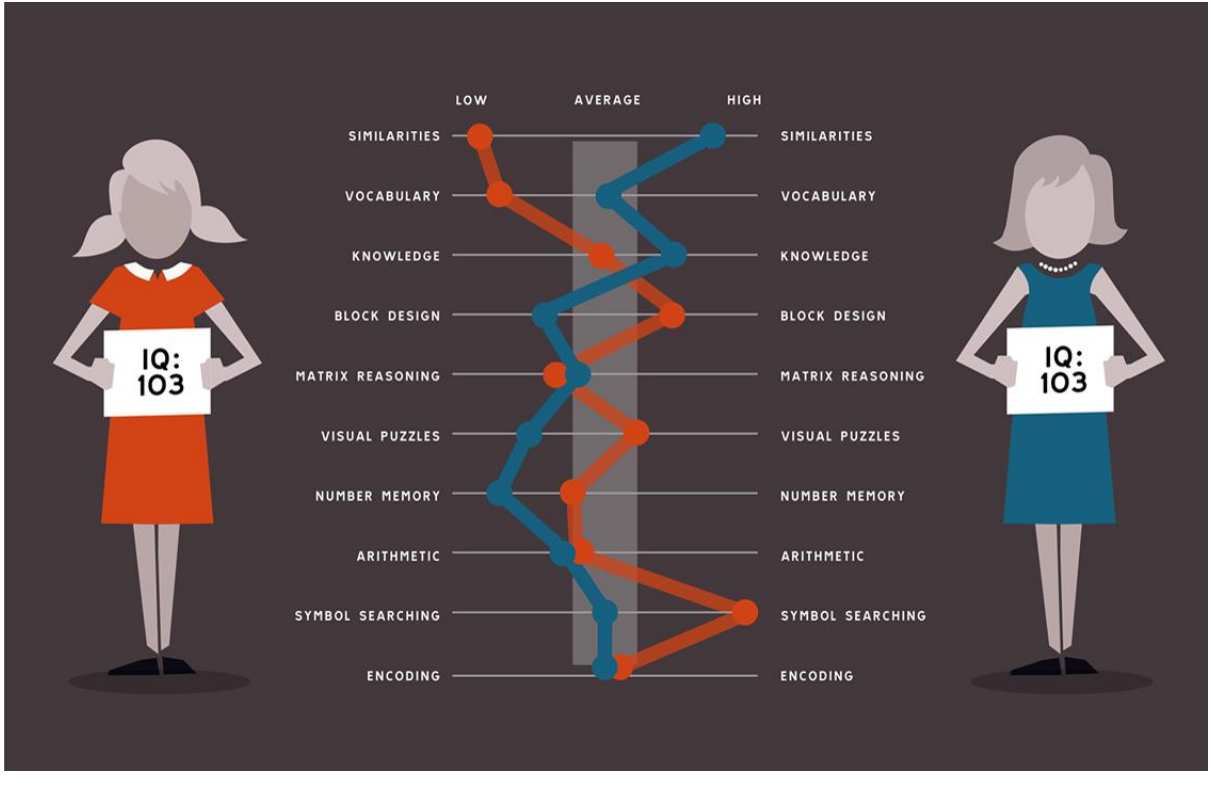
"Any system designed around the average person is doomed to fail."

Rose, T. (2015). The end of average, p. 4

RENAISSANCE®

Jagged intelligence

Advanced technologies make this attainable and visible



https://www.facebook.com/notes/todd-rose/nobody-is-average-heres-why/559091814254519

RENAISSANCE®

24

PISA 2015 results

Pilots, Norma, and big PISA data in the 21st century

Figure 2.1

United States' mean scores in science, reading and mathematics across PISA assessments

Mean score	Year of assessment					
	2015	2012	2009	2006	2003	2000
Science	496	497	502	489		
Mathematics	470	481	487	474	483	
Reading	497	498	500		495	504

NOTE: Grey cells indicate the major domain in each PISA assessment.
SOURCE: OECD, PISA 2015 Database, Tables 1.2.4a, 1.4.4a and 1.5.ra.

PISA's big data

Is this U. S. education's Sputnik or Laika moment?

". . . Policy makers are now reforming education systems through correlations based on big data without adequately understanding the details that make a difference in schools."

Strauss, V. (2016)

https://www.washingtonpost.com/news/answer-sheet/wp/2016/05/09/big-data-was-supposed-to-fix-education-it-didnt-its-time-for-small-data/?utm_term=.91b86ded3d70

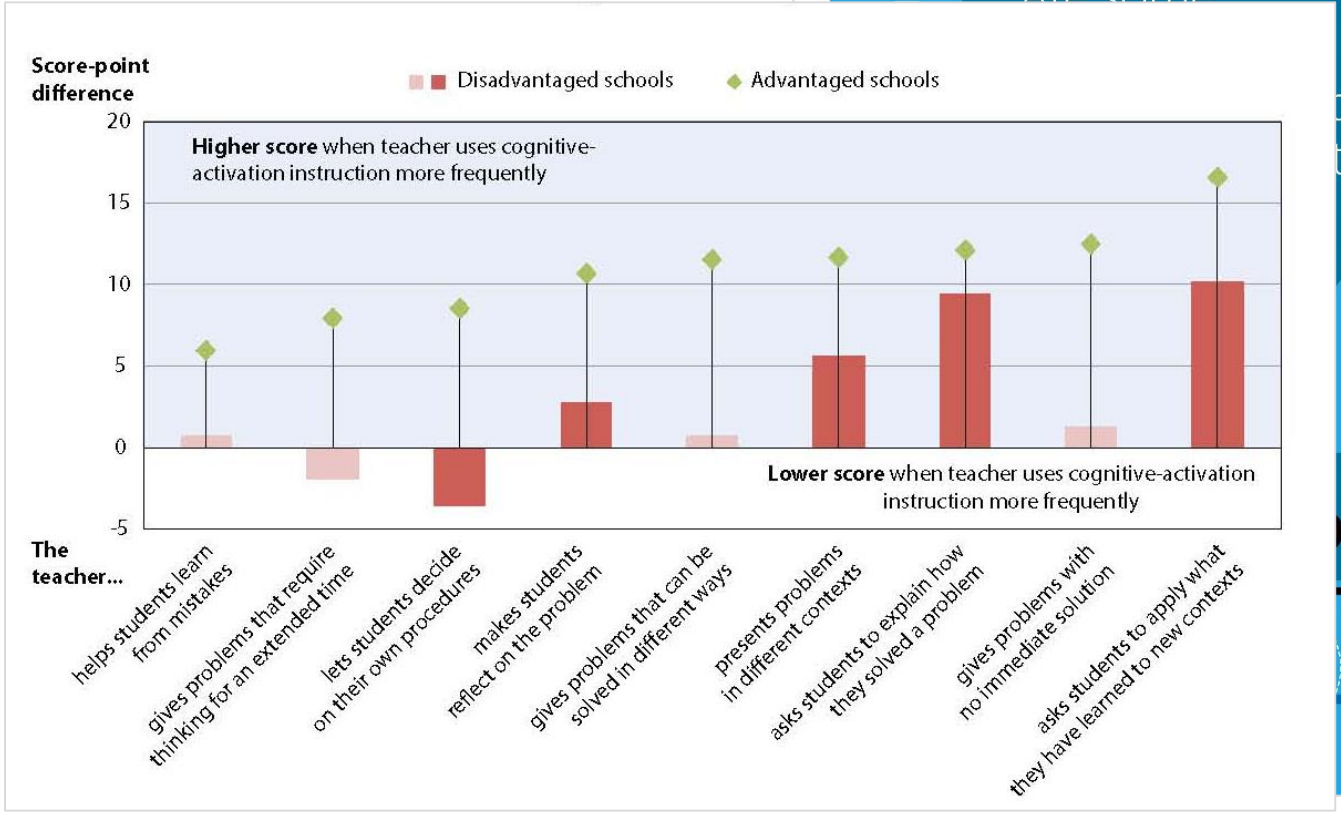
RENAISSANCE®

“Schools experimenting with children”

Smoker, M. 12/08/17 Savannah, GA presentation to Renaissance Advisory Board

PISA's jagged data

Finding the details that make a difference



http://www.oecd.org/publications/ten-questions-for-mathematics-teachers-and-how-pisa-can-help-answer-them-9789264265387-en.htm

Small data saves Lego

Humanizing data

RENAISSANCE®

Small (i.e., *jagged*) data

Specific attributes

"Seemingly insignificant behavioral observations containing very specific attributes pointing towards an unmet customer need."

Lindstrom, M. (2017)
https://www.martinlindstrom.com/small-data

RENAISSANCE®

Small (i.e., *jagged*) data

Breakthrough ideas

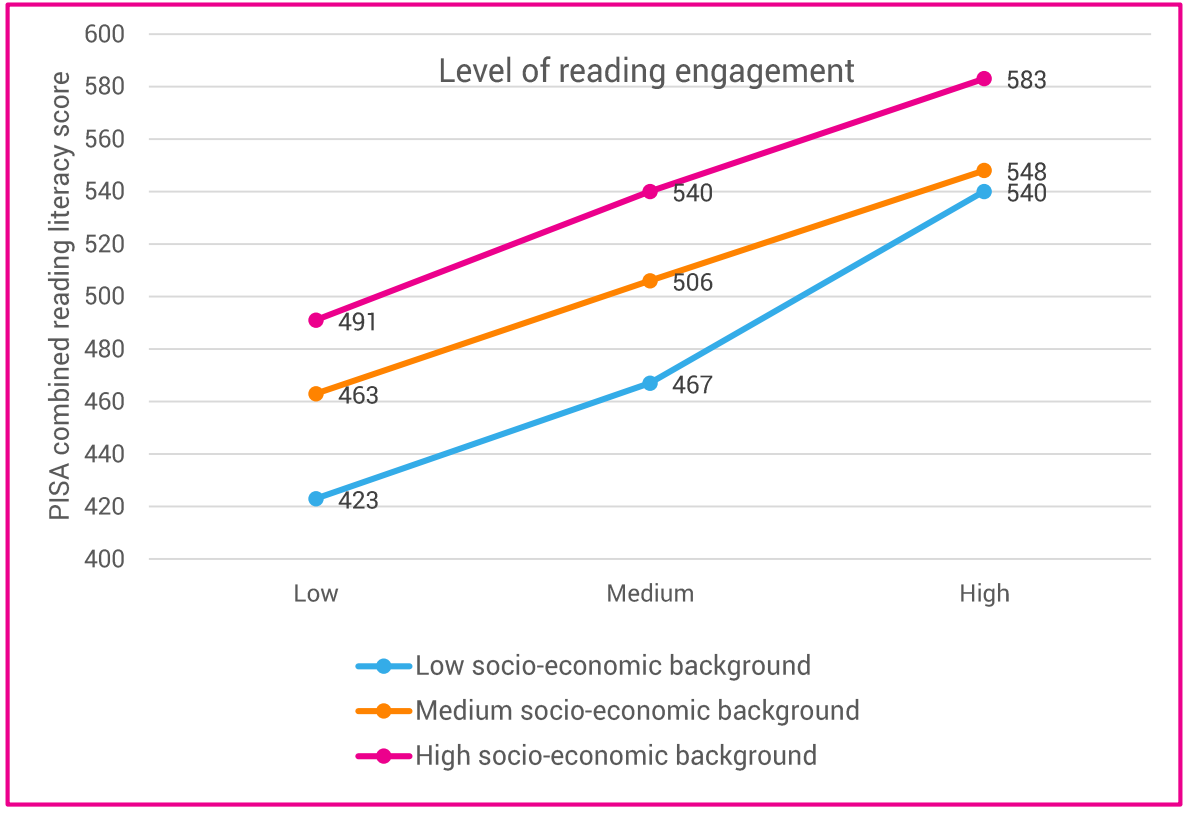
"Small data is the foundation for breakthrough ideas or completely new ways to turnaround brands."

Lindstrom, M. (2017)
https://www.martinlindstrom.com/small-data

RENAISSANCE®

Specific attributes

Let's adequately describe the details that make a difference in schools

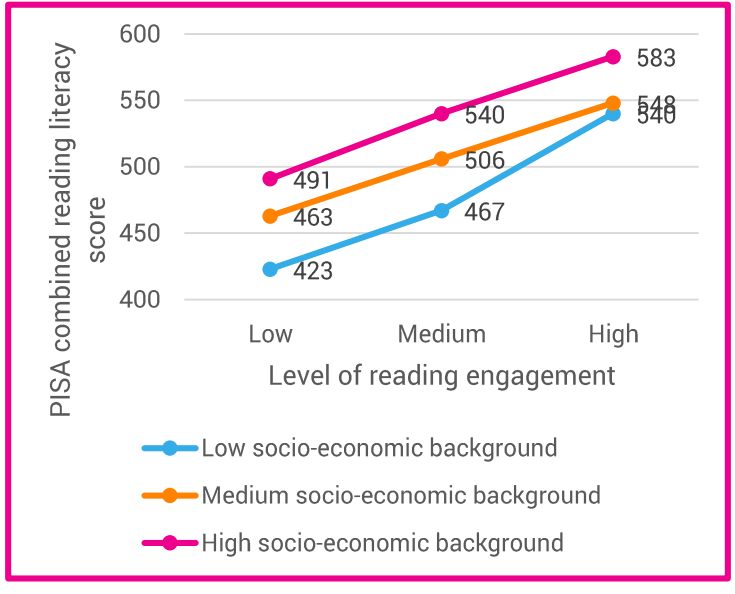


Kirsh, I., et. al. (2002) available
https://www.oecd.org/edu/school/programmeforinternationalstudentassessmentpisa/33690904.pdf

Breakthrough ideas

Let's adequately describe the details that make a difference in schools

Students with the lowest socioeconomic background—but high reading engagement—scored better than students with the highest socioeconomic background but—low reading engagement

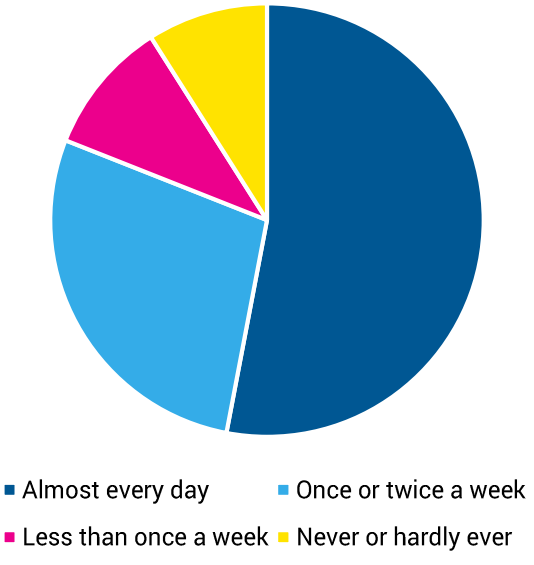


RENAISSANCE®

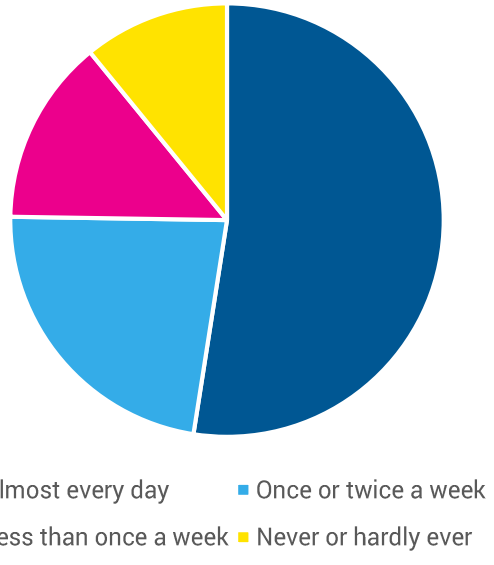
Attributes

Reading engagement in the U. S.

9-year-old reading in 1984



9-year-old reading in 2012

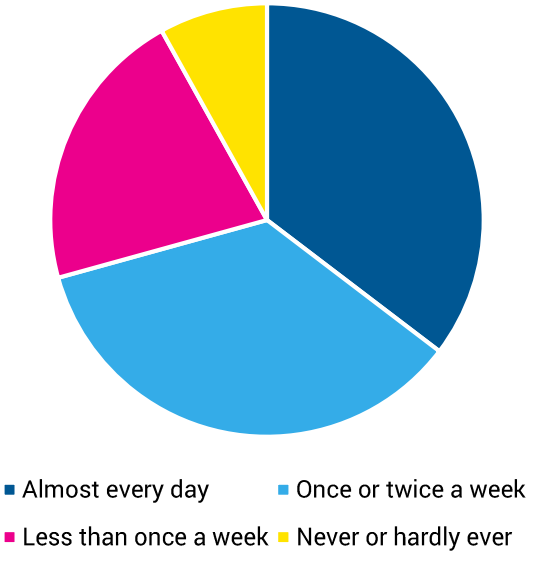


NAEP (2014) Long-term trend reading assessments.
Digest of Education Statistics 2014, table 221.30.

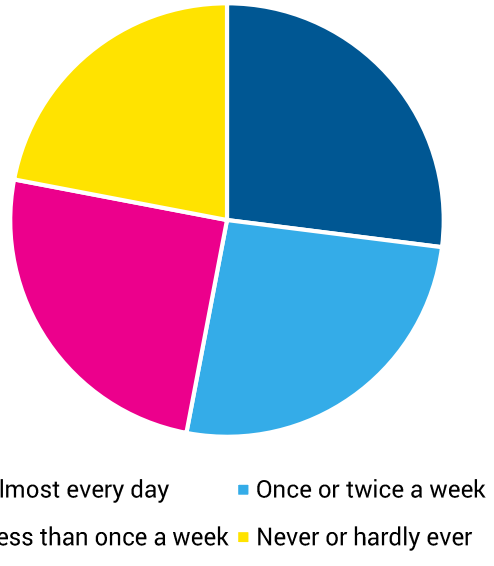
Attributes

Reading engagement in the U. S.

13-year-old reading in 1984



13-year-old reading in 2012

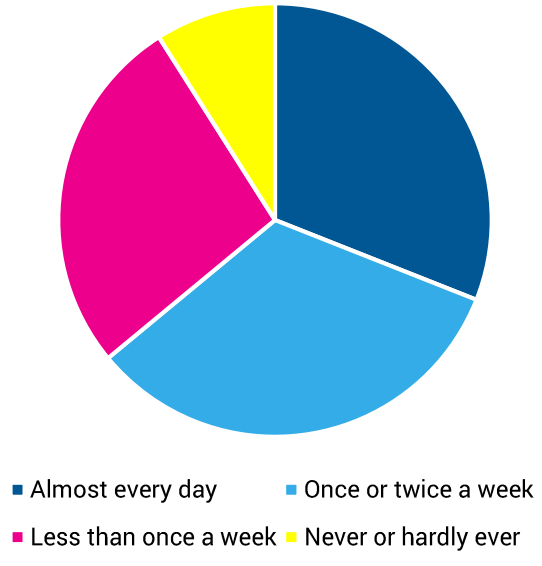


NAEP (2014) Long-term trend reading assessments.
Digest of Education Statistics 2014, table 221.30.

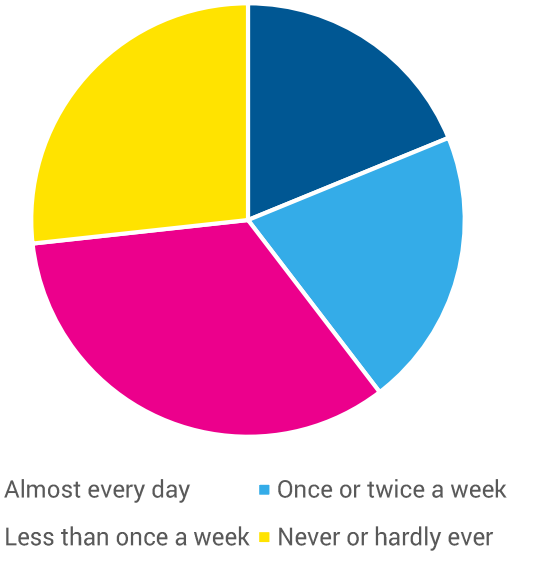
Attributes

Reading engagement in the U. S.

17-year-old reading in 1984



17-year-old reading in 2012



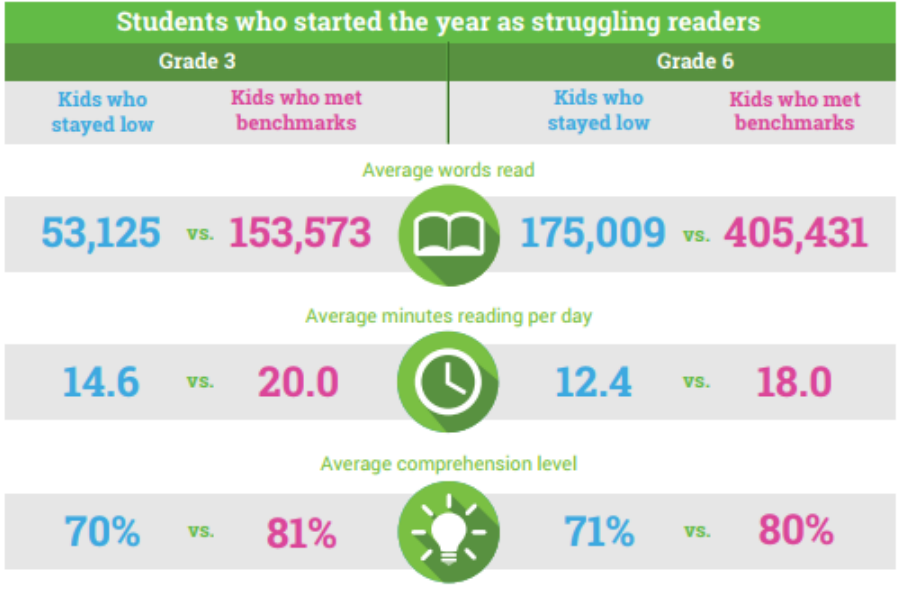
NAEP (2014) Long-term trend reading assessments.
Digest of Education Statistics 2014, table 221.30.

What happened?

Breakthrough ideas

The power of six additional minutes . . . .

High-quality daily reading practice helps struggling readers surge ahead



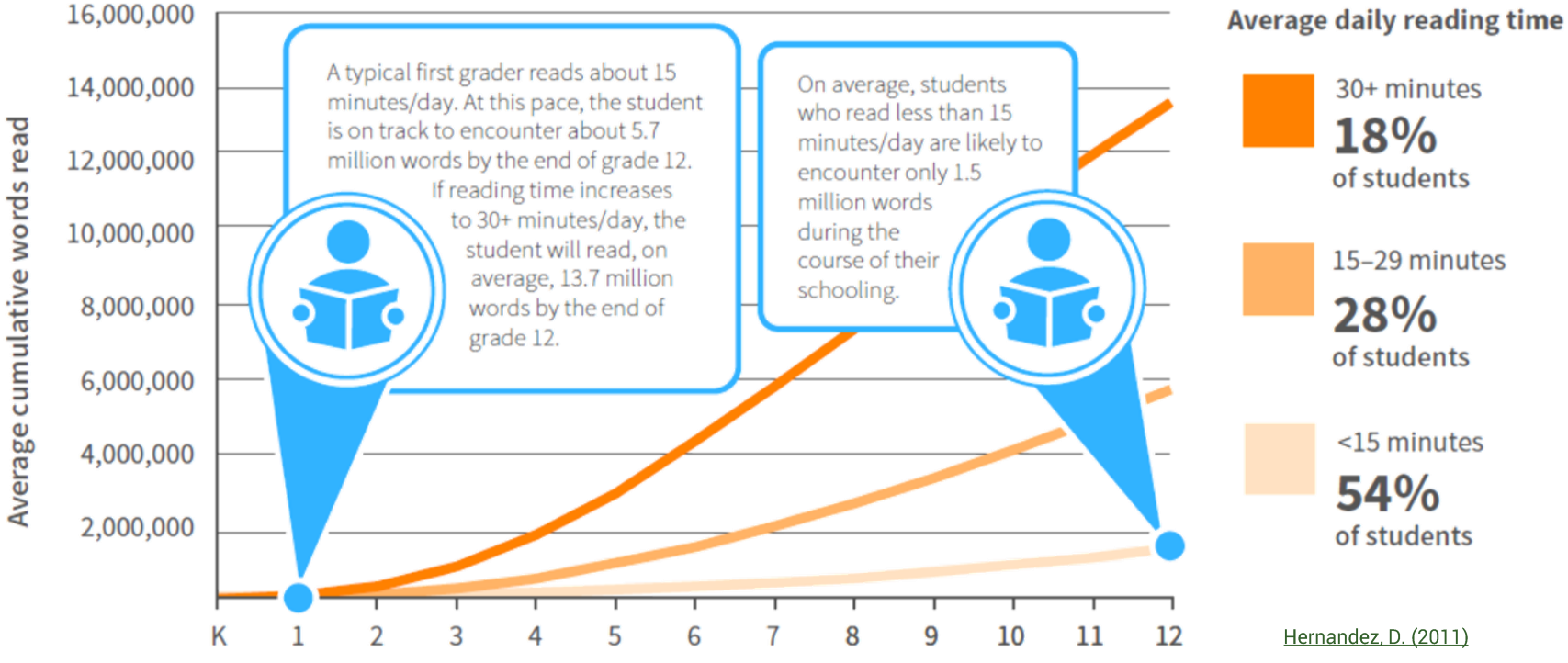
All students shown began the school year in the bottom quarter of reading achievement. Kids who read more words, spent more time reading each day, and read with greater understanding pulled ahead to end the year meeting college- and career-readiness benchmarks for their grade.

Source: Renaissance Accelerated Reader 360®, 2015–2016.

RENAISSANCE®

Breakthrough ideas

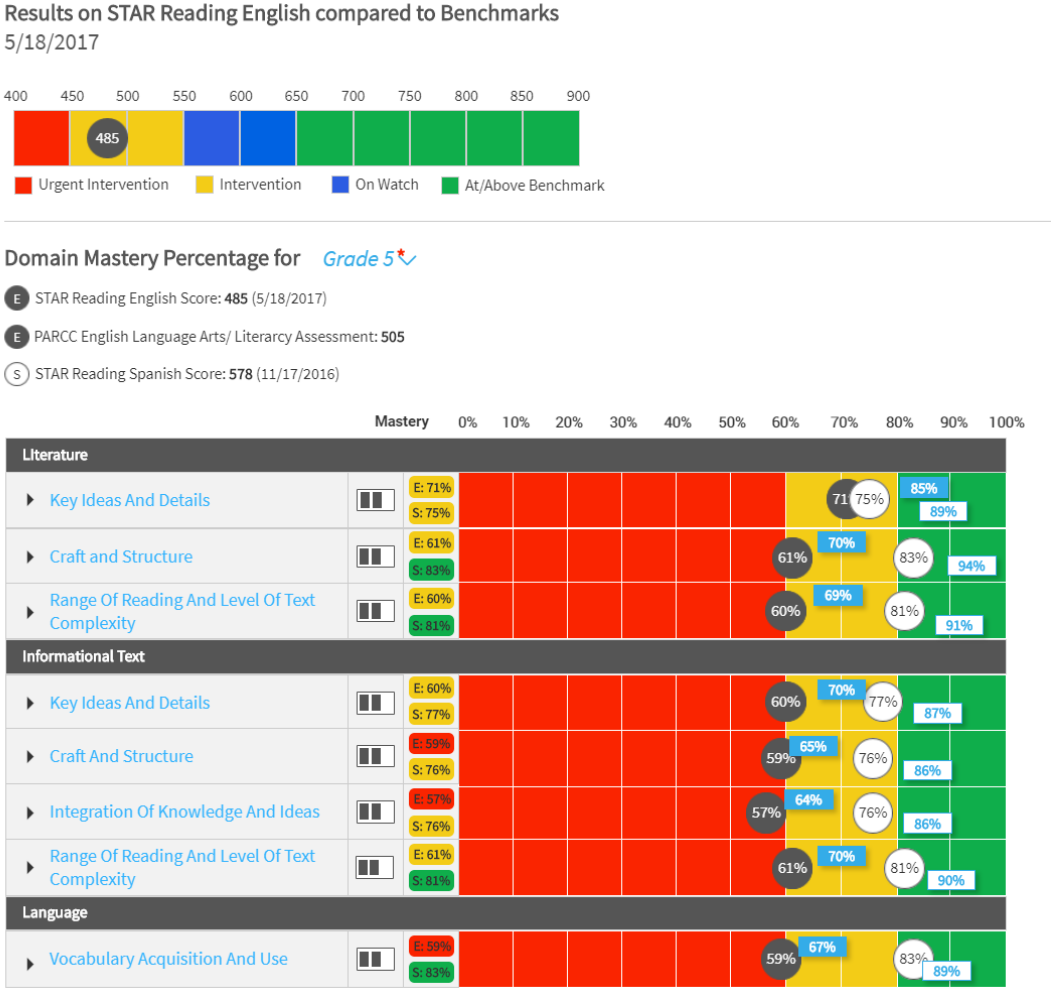
Vocabulary acquisition and concept development



Hernandez, D. (2011)

Making data actionable

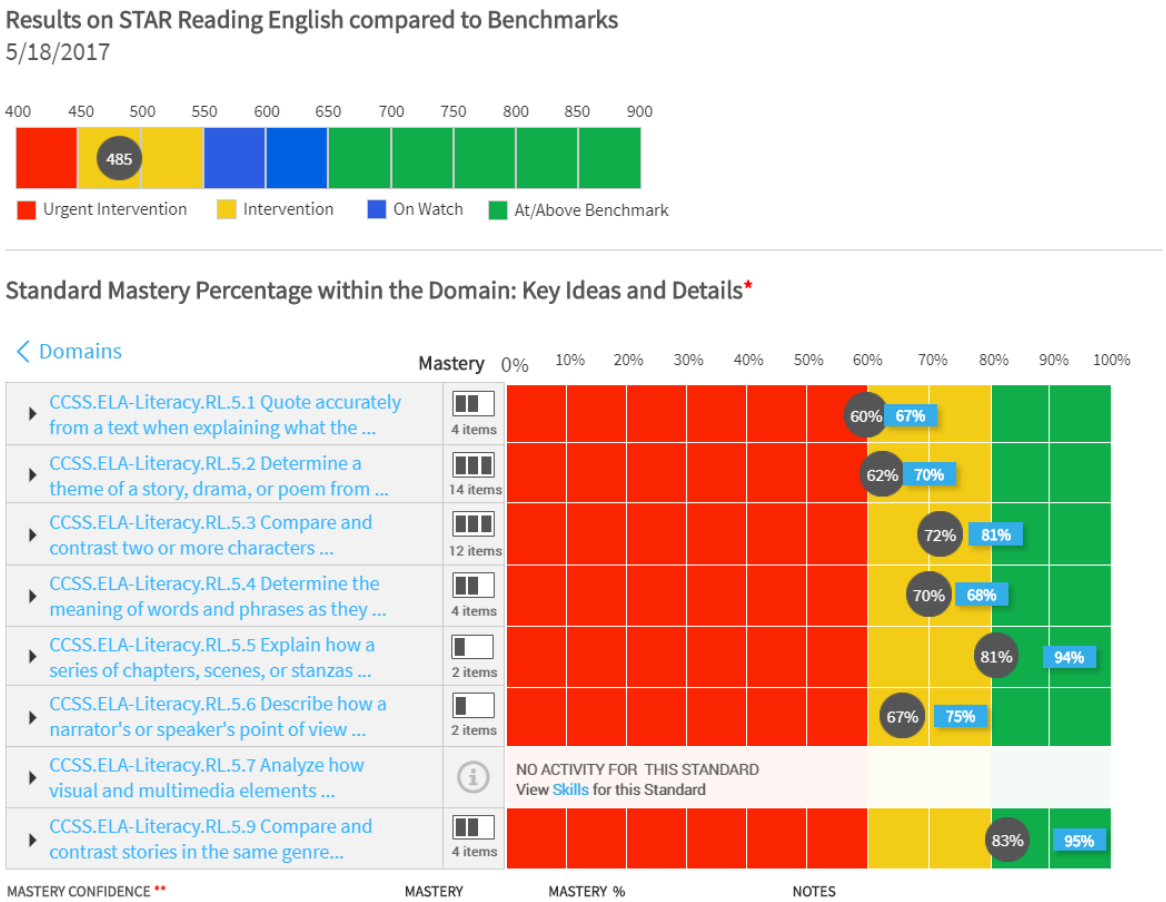
At the teacher desk level



RENAISSANCE®

Making data actionable

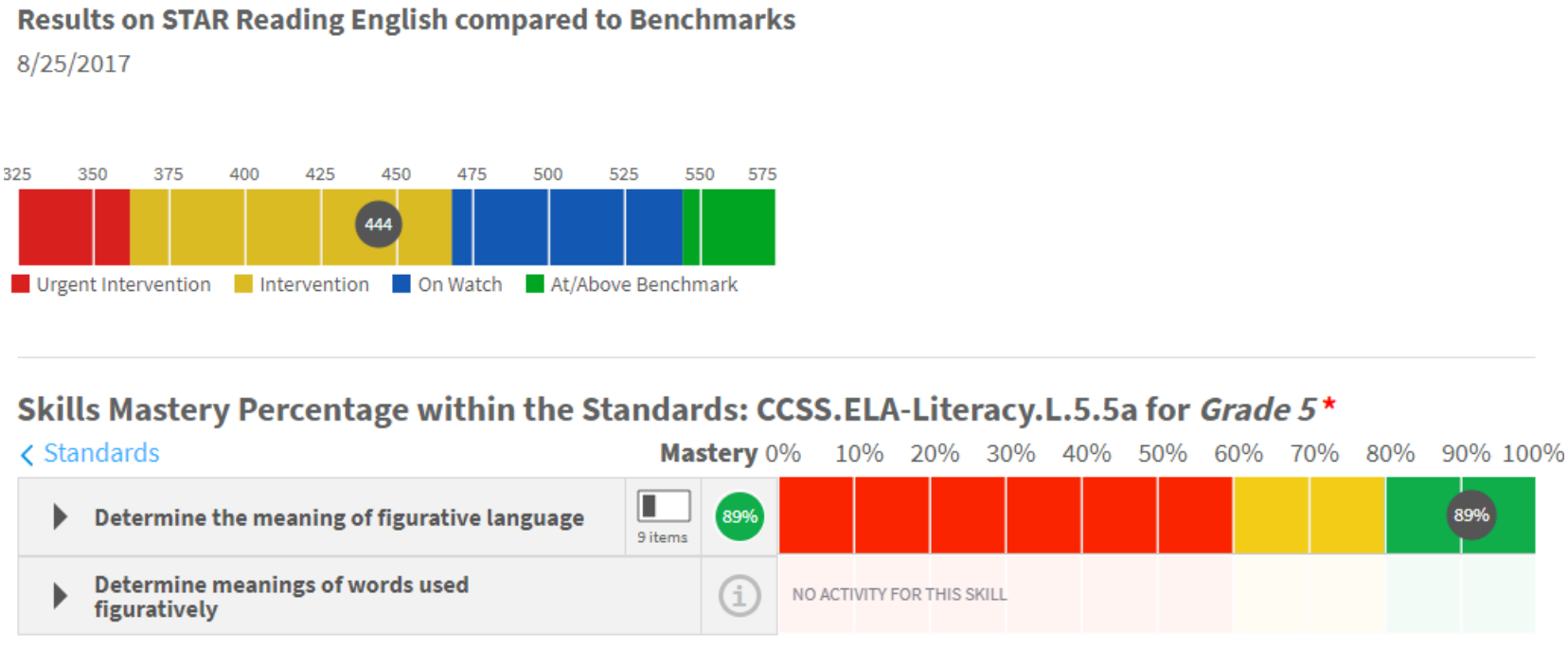
Look for jaggedness



RENAISSANCE®

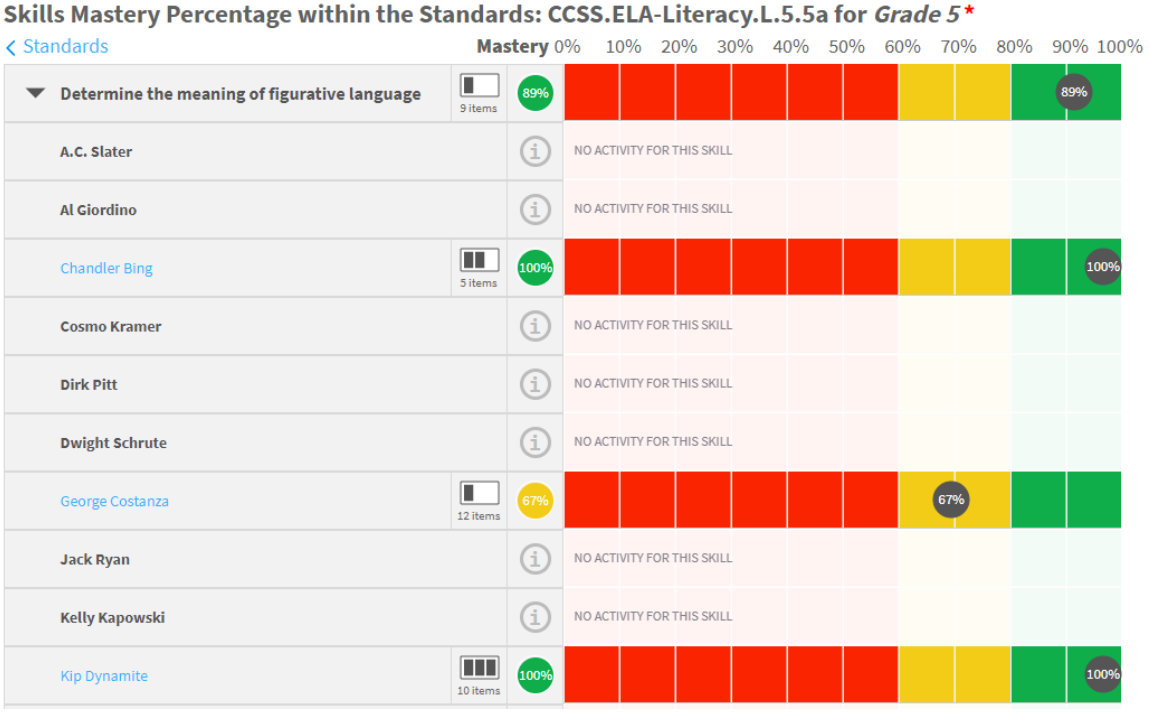
Making big data actionable

Look for specific attributes



Making big data actionable

Find your breakthrough idea



Big data, jagged edges, and a “little barker”

Provoke action that matters

RENAISSANCE®

Which breakthrough idea has greatest potential to make data more actionable in your district?

Sputnik (comparative data)

Laika (humanizing data)

Big jagged data (finding trends for deeper exploration rather than recommendations)

Small data (to find specific attributes and use them to develop breakthrough ideas)

What are data without humanity?

Lindstrom, M. (2017)

Thank you!

Jan K. Bryan, Ed. D. VP, National Education Officer, Renaissance
jan.bryan@renaissance.com

RENAISSANCE®