

Use Data to  
Tell Your Story

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ASCD Annual Conference  
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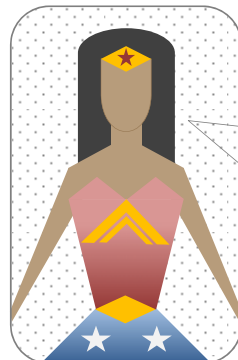
Session Goals

- Apply best practices of data visualization to tell a story.
- Select tools and strategies to guide communications using data.

A new kind of glasses



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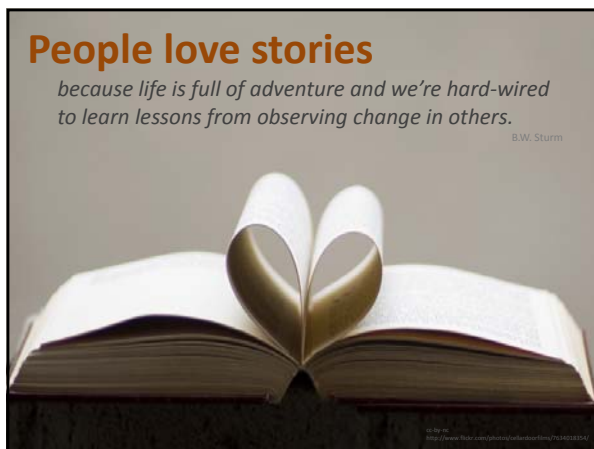
Data visualization gives us a **superpower** to change the realities we are looking at.

—Moritz Stefaner

People love stories


*because life is full of adventure and we're hard-wired to learn lessons from observing change in others.*

B.W. Sturm



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From data to wisdom



Statistics are empty calories.  
The individual **data** are nutritional.

—Kim Rees

## From data to wisdom

3  
7

Transform data into information.

Change

Data

Learn to swim...

if you're so scared of drowning in data.

Info

—Nathan Yau

## Information hierarchy

Data II: Electric Boogaloo

Data — Information — Knowledge — Wisdom

Knowledge is knowing that a tomato is a fruit.  
Wisdom is not putting it in a fruit salad.

—Miles Kington

## Got data?

- Review the staff and student ethnicity data.
- Sketch a representation of the data.

## Tell me a story

Percent Staff & Student Comparison by Ethnicity/Race

School year	Hispanic/Latino		American Indian		Asian		Black		White	
	Staff	Student	Staff	Student	Staff	Student	Staff	Student	Staff	Student
2004 - 05	3.5	13.2	1.0	3.0	2.8	7.7	2.1	6.0	90.4	69.3
2005 - 06	3.7	13.8	1.0	3.0	2.9	7.6	2.1	6.0	90.1	67.9
2006 - 07	3.7	14.4	1.0	2.9	3.0	7.5	2.1	5.9	89.9	66.5
2007 - 08	3.9	15.1	1.0	2.9	3.1	7.6	2.1	5.8	89.6	65.2
2008 - 09	4.1	15.7	1.0	2.8	3.1	7.6	2.1	5.8	89.3	63.8
2009 - 10	4.2	16.7	1.0	2.5	3.2	7.5	2.1	5.7	89.3	62.8
2010 - 11	4.7	19.2	0.9	1.8	2.6	6.9	1.9	4.9	87.3	60.8
2011 - 12	5.0	19.9	0.9	1.7	2.8	6.8	1.9	4.8	87.7	59.7
2012 - 13	4.9	20.5	0.9	1.6	2.9	6.9	2.0	4.8	87.6	58.9

## Pick a winner

1

2

3

**Choose Your Story**

A bad visualization is worth 1000 swear words.  
 —Ross and Bennett

### Chart Chooser

Chart Suggestions—A Thought-Starter

<http://www.extremepresentation.com/design/charts/>

### Stories

**Comparison**  
Groups or periods of time

**Part-to-Whole**  
Difference or proportion

### Pop Quiz!

The 16" pizza is \_\_\_ times as large as the 8" pizza.

a. two    b. four    c. six    d. ~~ate~~ eight

### Poor judge of area

Average price \$16.59  $\neq$  Average price \$33.00

Source: <http://www.npr.org/blogs/money/2014/02/26/282132576/74-476-reasons-you-should-always-get-the-bigger-pizza>

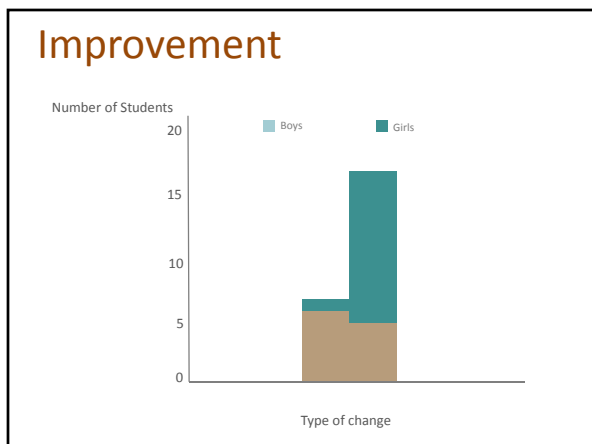
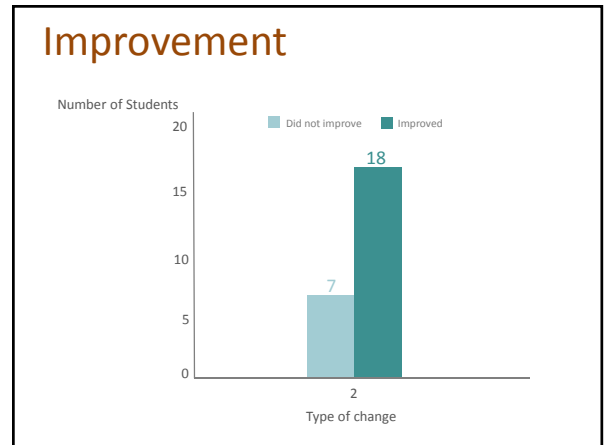
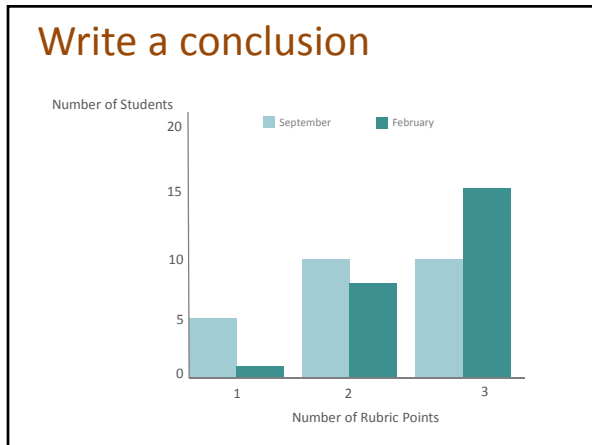
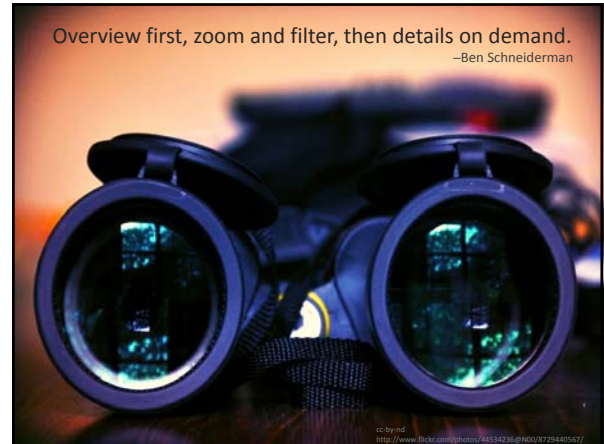
### First, do no pies...

Although the quantities are really **plotted as arcs** of the circumference

the **eye sees them as areas** of segments subtended by these arcs.

## Stories

<p><b>Comparison</b> Groups or periods of time</p>	<p><b>Part-to-Whole</b> Difference or proportion</p>
<p><b>Distribution</b> Understand a population</p>	<p><b>Relationship</b> Patterns and outliers</p>



## Pick a winner

1  
Bar Chart

2  
Line Chart

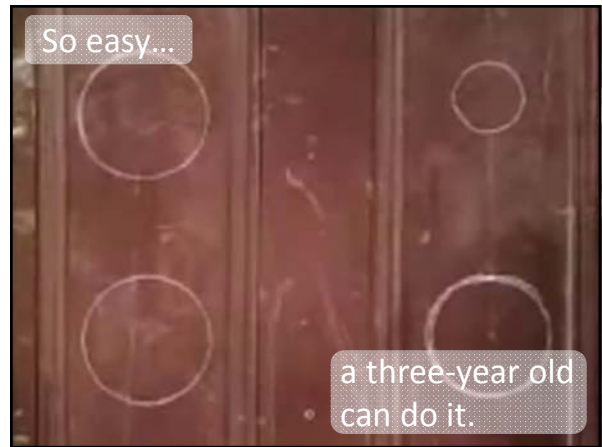
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**Build Character**

Pleasant things work better.  
—Don Norman

### Objects

Line	Point	Bar
Not used for ranking	Not used for part-to-whole	Can be used for all (except maps)



### Form

 Length	 Width	 Size	 Shape
 Orientation	 Curvature	 Enclosure	 Blur

### Color and Position

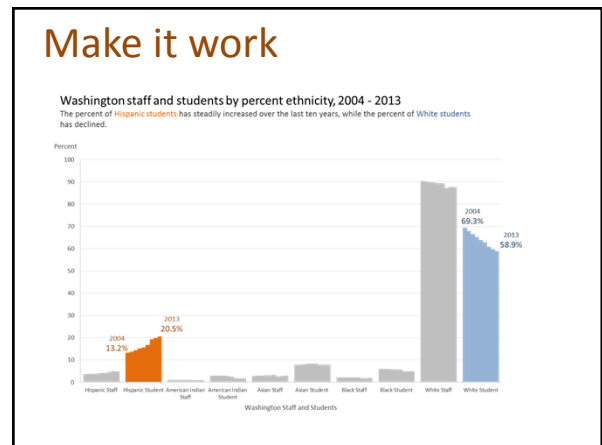
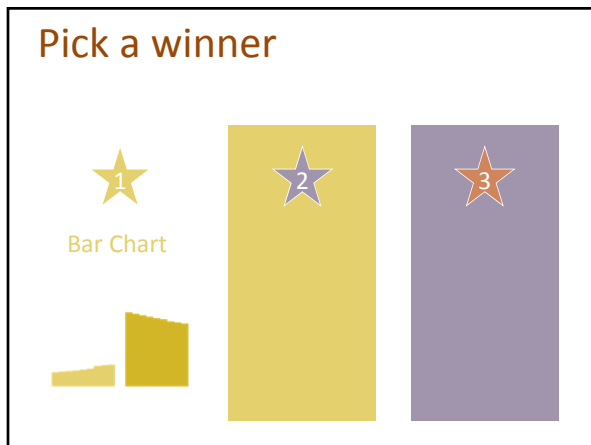
 Hue	 2D location
 Intensity	 Grouping

### Data-to-ink ratio

*Above all else, show the data.*  
—Edward Tufte

Student	Item Number				
Student	1	2	3	4	5
Anderson, Melanie	1	0	0	0	0
Dalton, Craig	1	1	1	0	0
Gallego, Peter	1	1	1	1	1
Herrera, Sylvia	1	1	0	1	0
LaCrosse, Martin	1	1	1	0	0
Peterson, Michelle	1	0	1	1	0
Sanders, Karen	0	0	0	0	0
Walters, Darren	0	1	1	0	0
Wu, Alice	1	1	0	0	0

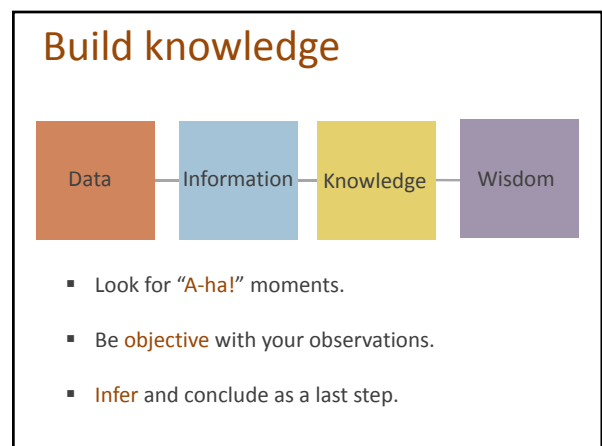
- ### Color
- Use **palettes** that reflect the **natural world**.
  - Use an **accent color**.
  - Be careful with **red**.



### Next Chapter

I don't have any solution, but I certainly admire the problem.

—Ashleigh Brilliant



## Make observations

*I see... or I notice...*

- How do the data sets **compare** to each other?
- What are the **commonalities** among a given data set?
- What **patterns or similarities** are evident across the data sets?
- What **inconsistencies or discrepancies** (if any) are evident?
- What is **not represented** in the data?
- What **questions** do the data raise?

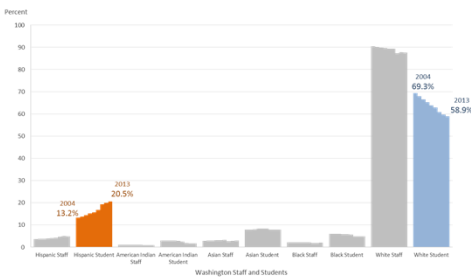
## Develop inferences

*And I think this means that...*

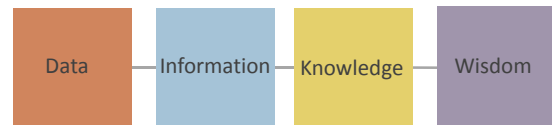
- What areas of the data need **further explanation**?
- What **patterns or themes** do you see in the observations?
- Which of the observations are **most relevant and important** to your inquiry?
- What **assumptions** might be underneath what you notice in the data?
- What **clues** might help explain missing data?

## Observe and infer

Washington staff and students by percent ethnicity, 2004 - 2013  
The percent of Hispanic students has steadily increased over the last ten years, while the percent of White students has declined.



## Share your wisdom



- Develop **SMART goals**.
- Create an **action plan**.
- Apply **interventions and progress monitoring**.

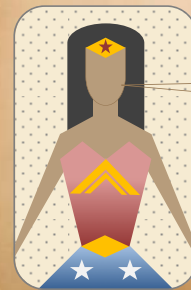
## Remember

What you get out of your data is only as good as what you put in.

You can change education policy by improving data quality.



## Be a hero



Tell your data story.

## Keep in Touch

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