

FINDING THE STORY IN YOUR DATA

Presented to Joint Software and IT Cost Forum

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A COST ESTIMATE CONTAINS MANY STORIES

Bid Item No.	Bid Item Description		Total Material Cost	Total Labor Cost	Total Equipment Cost	Total Direct Construction Costs
Bid Item: 1	Replace Pit Toilets with New Comfort Station					
	A10	Foundations	\$ 30,028	\$ 33,082	\$ 7,293	\$ 70,403
	A20	Basement Construction	\$ -	\$ -	\$ -	\$ -
	B10	Superstructure	\$ 15,622	\$ 13,198	\$ 460	\$ 29,280
	B20	Exterior Enclosure	\$ 35,992	\$ 29,477	\$ -	\$ 65,469
	B30	Roofing	\$ 18,471	\$ 8,706	\$ -	\$ 27,177
	C10	Interior Construction	\$ 25,573	\$ 9,308	\$ -	\$ 34,881
	C30	Interior Finishes	\$ 4,478	\$ 13,424	\$ -	\$ 17,900
	D20	Plumbing Systems	\$ 28,655	\$ 16,121	\$ -	\$ 42,776
	D30	HVAC	\$ 1,289	\$ 1,170	\$ -	\$ 2,439
	D50	Electrical	\$ 8,753	\$ 9,366	\$ -	\$ 18,119
	F20	Selective Building Demolition	\$ 463	\$ 1,990	\$ 3,862	\$ 6,315
	G10	Site Preparation	\$ 2,188	\$ 4,382	\$ 6,952	\$ 13,502
	G20	Site Improvements	\$ 8,900	\$ 7,300	\$ -	\$ 16,200
	G30	Site Mechanical	\$ 86,213	\$ 32,582	\$ 44,542	\$ 163,337
	G40	Site Electrical	\$ 5,000	\$ -	\$ -	\$ 5,000
	XX	Standard General Conditions	\$ 31,900	\$ 101,200	\$ 18,610	\$ 151,710
Total - Bid Item 1	Replace Pit Toilets with New Comfort Station		\$ 301,503	\$ 281,286	\$ 81,719	\$ 664,508
Bid Item: 2	Construct New Parking Lot & Site Utilities					
	G10	Site Preparation	\$ 2,500	\$ 11,711	\$ 19,776	\$ 33,987
	G20	Site Improvements	\$ 143,581	\$ 36,335	\$ 43,670	\$ 223,586
	G30	Site Mechanical	\$ 12,153	\$ 14,232	\$ 4,241	\$ 30,626
	XX	Standard General Conditions	\$ 12,925	\$ 8,350	\$ 6,500	\$ 27,775
			\$ -	\$ -	\$ -	\$ -
Total - Bid Item 2	Construct New Parking Lot & Site Utilities		\$ 171,159	\$ 70,628	\$ 74,187	\$ 315,974
Bid Item: 3	Picnic Area & Trailhead Improvements					
	G10	Site Preparation	\$ -	\$ 11,860	\$ 4,845	\$ 16,705
	G20	Site Improvements	\$ 59,448	\$ 25,960	\$ 12,270	\$ 97,678
	G30	Site Mechanical	\$ 2,125	\$ 2,275	\$ 330	\$ 4,730
	XX	Standard General Conditions	\$ 5,775	\$ 7,550	\$ 2,500	\$ 15,825
			\$ -	\$ -	\$ -	\$ -
Total - Bid Item 3	Picnic Area & Trailhead Improvements		\$ 67,348	\$ 47,645	\$ 19,945	\$ 134,938
Total Bid Items 1-3			\$ 540,010	\$ 399,559	\$ 175,851	\$ 1,115,420

POLL QUESTION

What type of data visualization would be most effective for telling this story?

- Table
- Bar chart
- Pie chart
- Heat map

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	G10	Site Preparation	\$ 2,188	\$ 4,362	\$ 6,952	\$ 13,502
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COST DRIVER STORY – USING A TABLE

	Materials		Labor		Equipment	
Bid Item 1 - Replace Pit Toilets with New Comfort Station	\$301,503	70%	\$281,286	76%	\$81,719	86%
Site Mechanical	\$86,213	29%	\$32,582	12%	\$44,452	54%
Exterior Enclosure	\$35,992	12%	\$29,477	10%	\$0	0%
Standard General Conditions	\$31,900	11%	\$101,200	36%	\$18,610	23%
Foundations	\$30,028	10%	\$33,082	12%	\$7,293	9%
Plumbing Systems	\$26,655	9%	\$16,121	6%	\$0	0%
Bid Item 2 - Construct New Parking Lot & Site Utilities	\$171,159	92%	\$70,628	88%	\$74,187	91%
Site Improvements	\$143,581	84%	\$36,335	51%	\$43,670	59%
Site Preparation	\$2,500	1%	\$11,711	17%	\$19,776	27%
Site Mechanical	\$12,153	7%	\$14,232	20%	\$4,241	6%
Bid Item 3 - Picnic Area & Trailhead Improvements	\$67,348	88%	\$47,645	54%	\$19,945	62%
Site Improvements	\$59,448	88%	\$25,960	54%	\$12,270	62%

TOP WBS COST DRIVER STORY – USING A HORIZONTAL BAR CHART

Replacing Toilets with New Comfort Station is Biggest Cost Driver!

Bid Item 1 - Replace Pit Toilets with New Comfort Station

60%

Bid Item 2 - Construct New Parking Lot & Site Utilities

28%

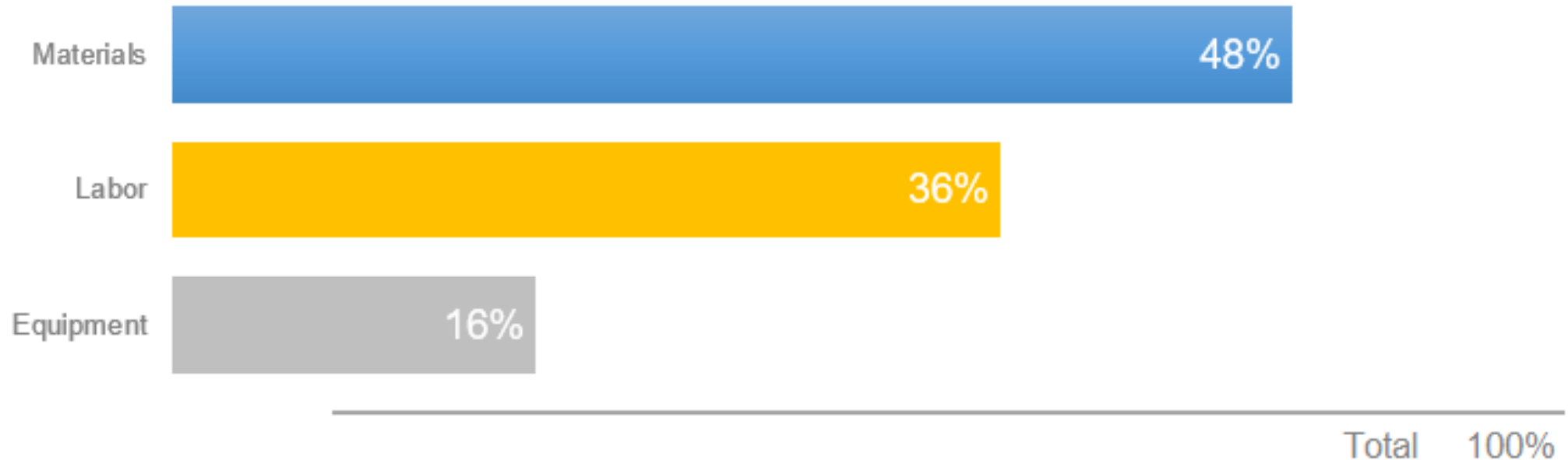
Bid Item 3 - Picnic Area & Trailhead Improvements

12%

Total 100%

DIFFERENT STORY – SAME DATA!

Site Improvement Materials for New Parking Lot and Utilities Drive Overall Cost



SAME STORY DIFFERENT VISUAL – USING SIMPLE TEXT

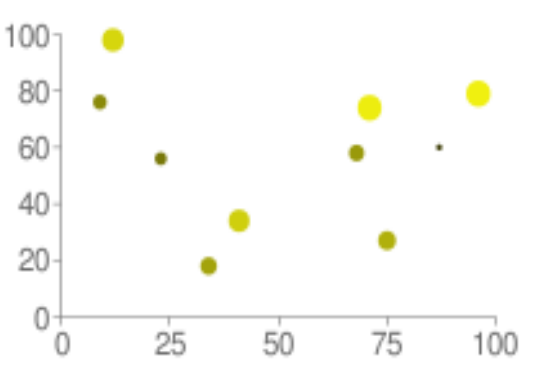
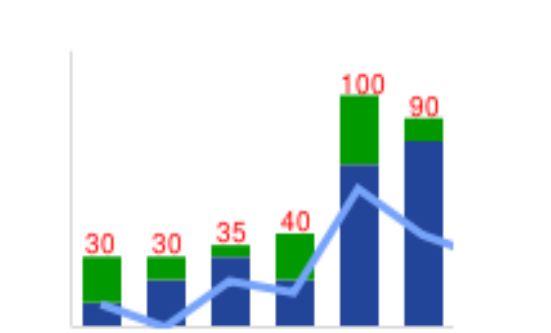
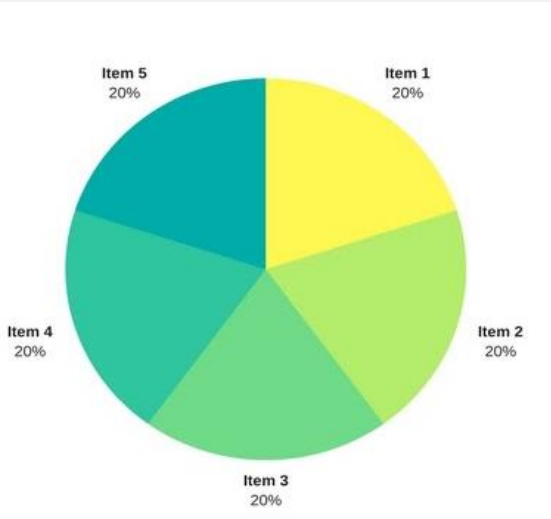
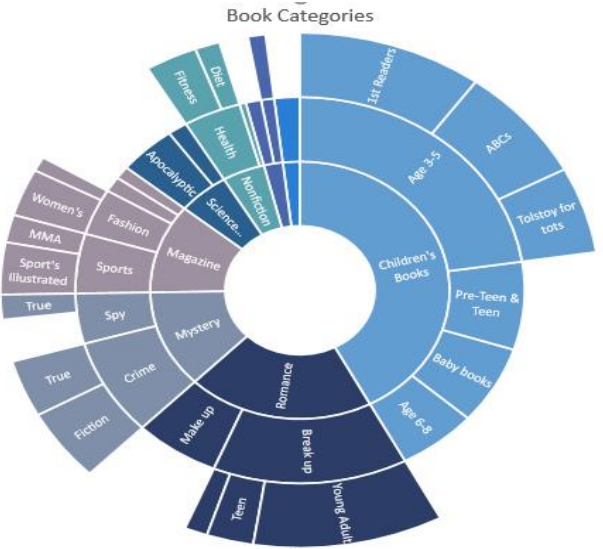
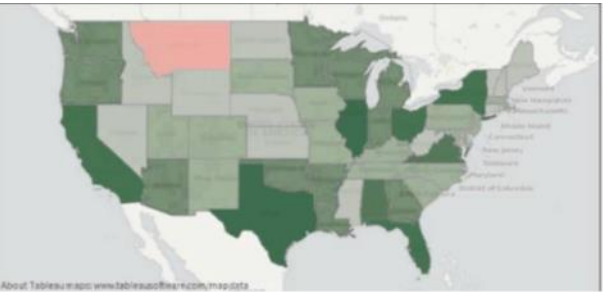
54%

of material costs are driven by **site improvements** or **mechanical upgrades**

POLL QUESTION

What data visualization tools are you using?

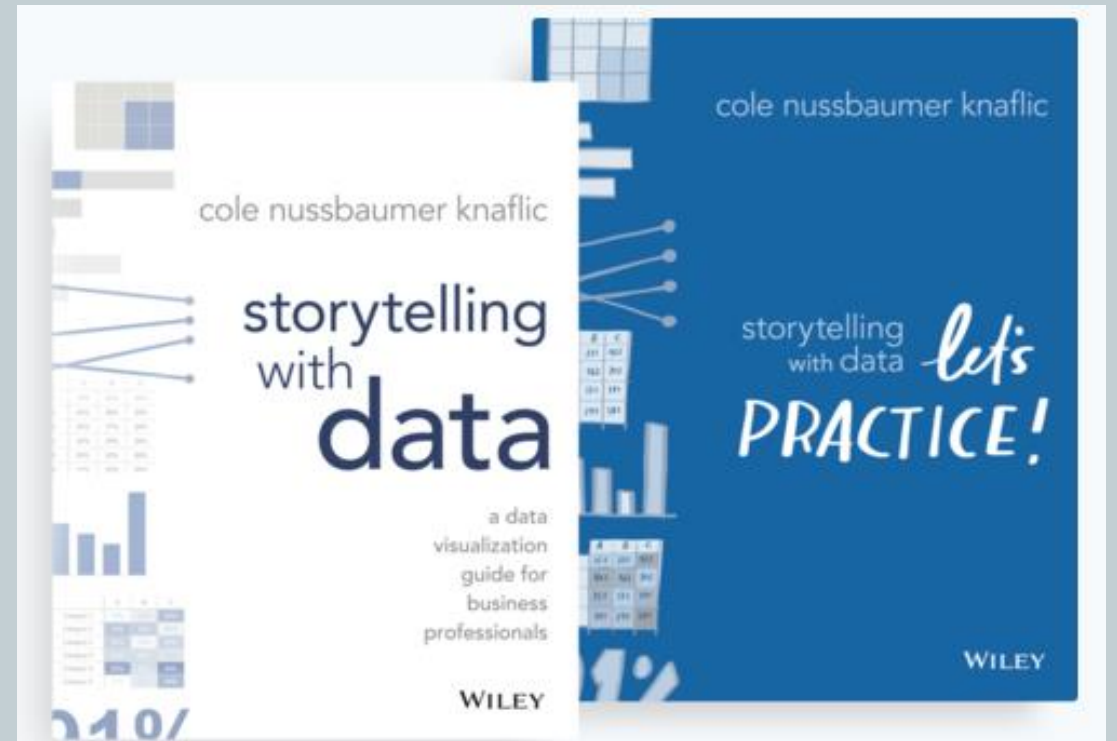
- Tableau
- Power BI
- Google charts
- Excel



STORYTELLING WITH DATA

INTRODUCTION

- These books were written for anyone who plans to use data to communicate something to others with the goals of
 - Creating **effective** data visuals,
 - Keeping your **audience's attention** on your presentation, and
 - **Influencing decisions** using your data story



THE IMPORTANCE OF STORYTELLING

- People love to hear stories!
 - They are useful for both **entertaining as well as educating** by providing a fun way to share knowledge and experiences
 - Storytelling helps your **audience to connect** with your data and **care about** your message
 - <https://www.youtube.com/watch?v=mSi0kmaqOBu4>
- The world is getting inundated with information
 - Data is the new “oil”
 - Determining meaningful ways to **sift the gold nuggets** from all the dirt requires **new skills**

STORYTELLING WITH DATA OVERVIEW

- Understand the **context**
 - Know with **whom** you will be communicating to, what they **need to know**, and how you will **deliver** your message
 - Employ the **3-minute story**, the **Big Idea**, and **storyboarding** to articulate your findings
- Choose an appropriate **visual display**
 - When highlighting a number or two, **simple text** is best
 - Line charts work well with **continuous data**
 - Bar charts are perfect for showing **categorical data**, but must have a **zero baseline**
 - **Avoid 3D, pie charts, and secondary axes**

Pilot program was a success

After the pilot program,

68%

of kids expressed interest towards science, compared to 44% going into the program.

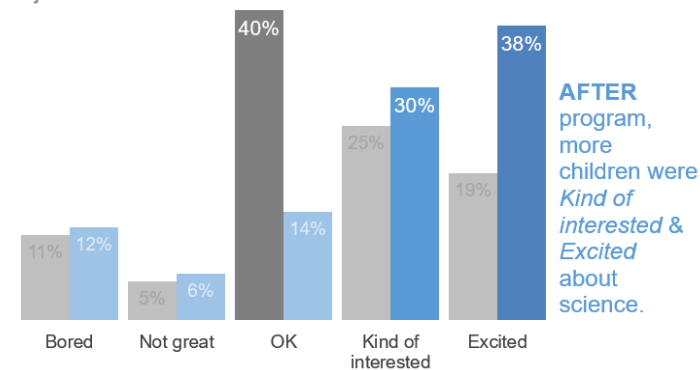
Based on survey of 100 students conducted before and after pilot program (100% response rate on both surveys).

Show the **numbers** directly

Pilot program was a success

How do you feel about science?

BEFORE program, the majority of children felt just *OK* about science



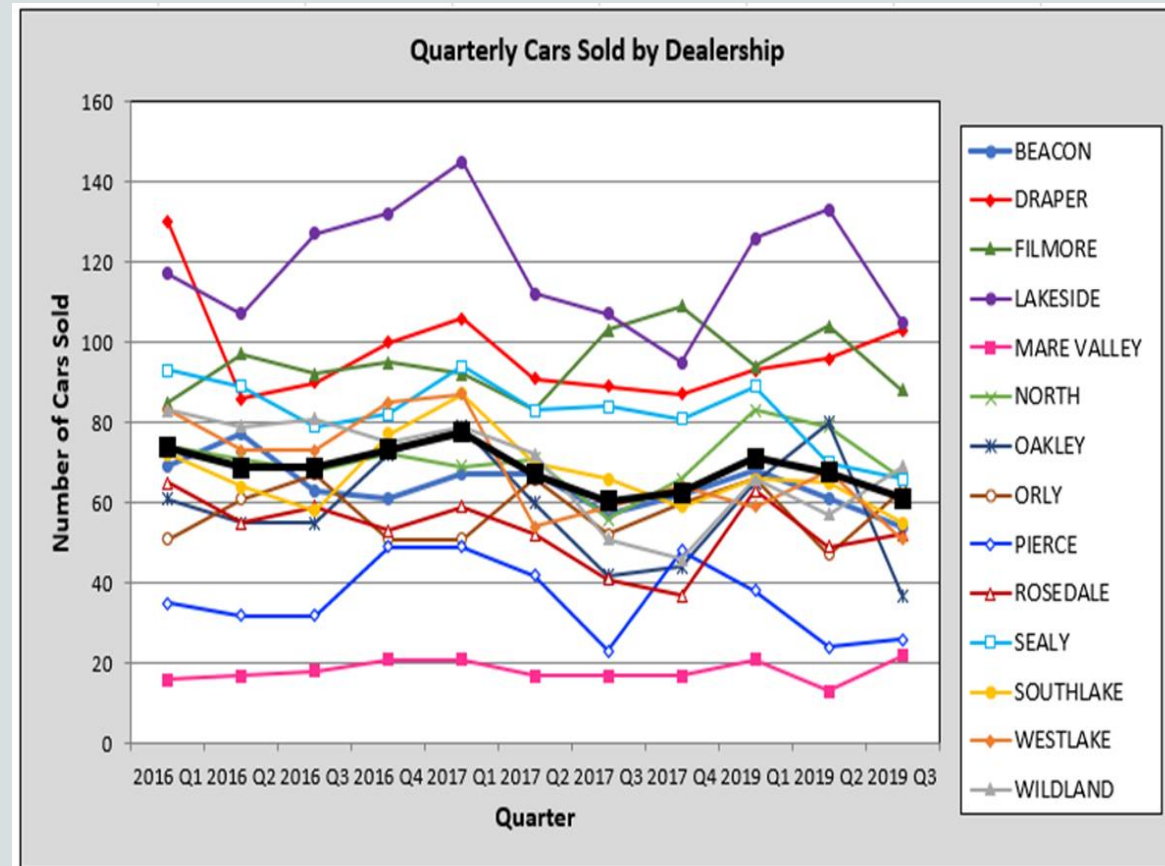
Based on survey of 100 students conducted before and after pilot program (100% response rate on both surveys).

Use a simple **bar graph** when **comparing** two things

- Keep them **close together**
- Align them to a **common baseline**

STORYTELLING TECHNIQUES

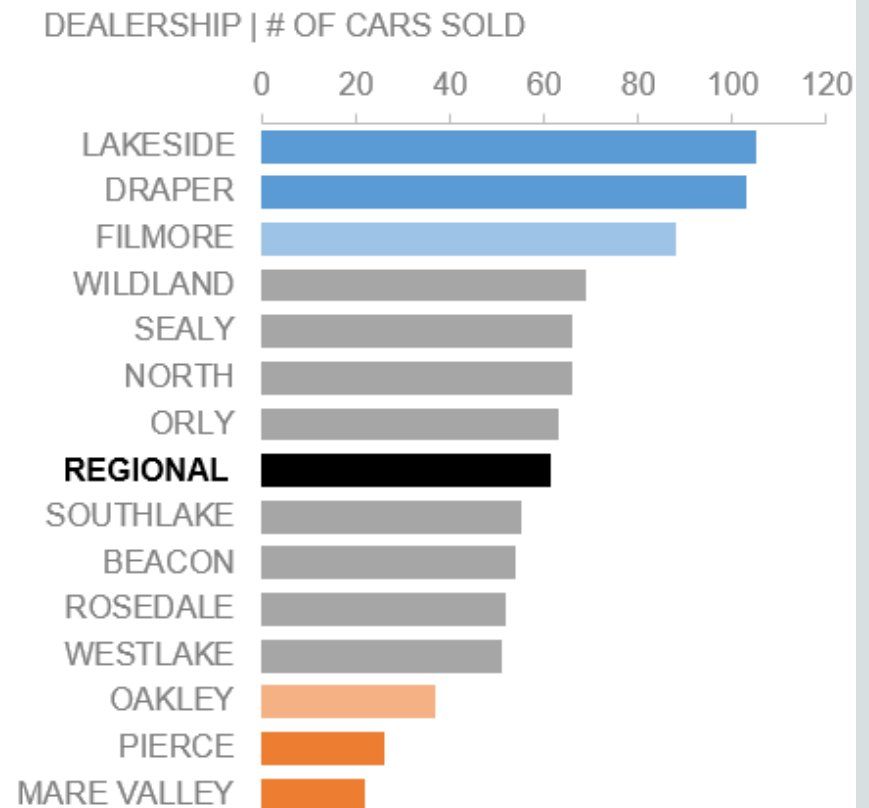
- **Eliminate clutter!**
 - Anything that does not support your message should be **excluded**
 - Leverage **Gestalt** principles for how people see things and **use contrast** strategically
 - Align all elements and maintain adequate **white space**



STORYTELLING TECHNIQUES

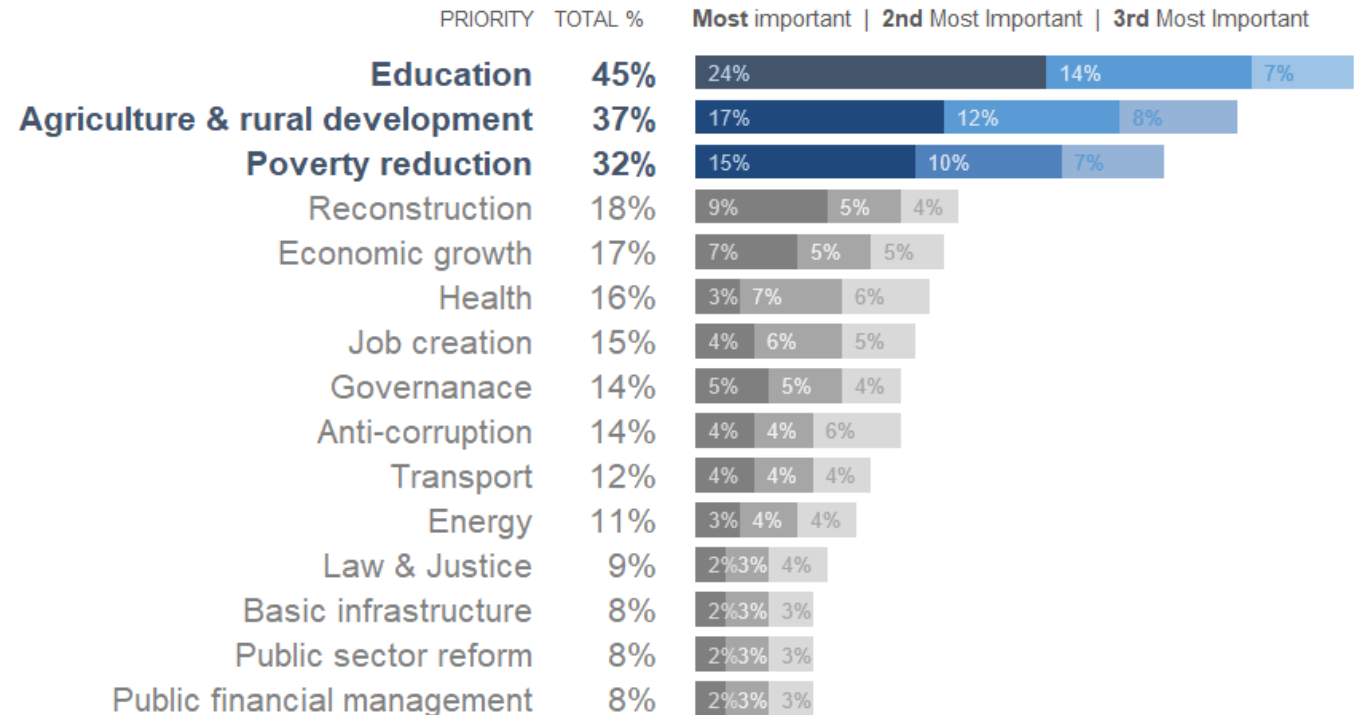
- **Focus attention** where you want it
 - Rely on the power of **preattentive attributes** to **signal where to look**
- Think like a **designer**
 - Include **visual** affordances that tell the audience how to read your graphic
 - Use **highlighting** and **text** to label and explain the story

Car sales by dealership: Q3



PACK LOTS OF
DATA INTO A
STACKED
HORIZONTAL BAR
GRAPH

Top 15 development priorities, according to survey

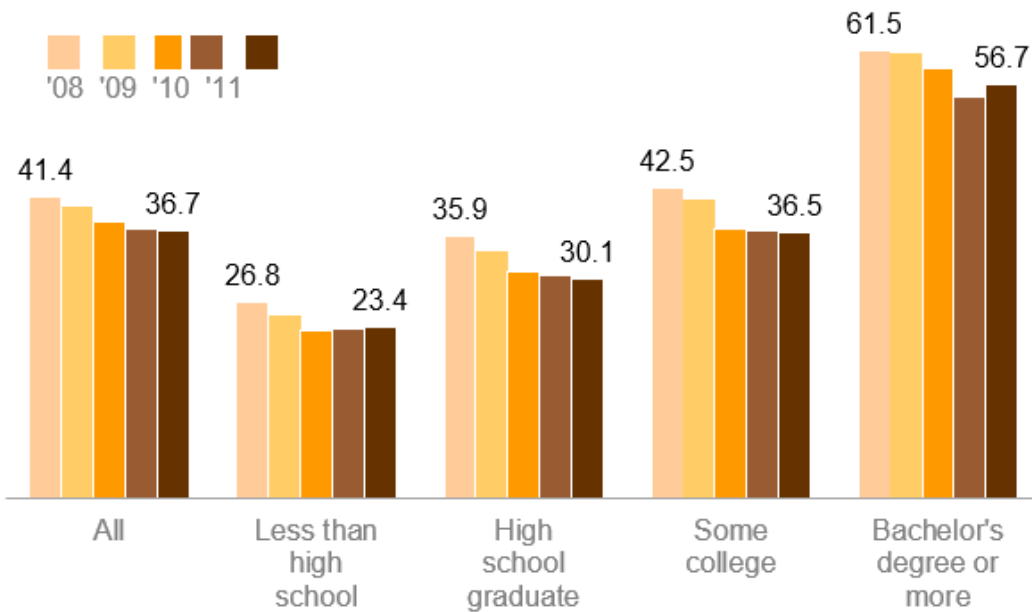


N = 4,392. Based on responses to item, *When considering development priorities, which one development priority is the most important? Which one is the second most important priority? Which one is the third most important priority?* Respondents chose from a list. Top 15 shown.

SIMPLIFY THE DATA

New Marriage Rate by Education

Number of newly married adults per 1,000 marriage eligible adults



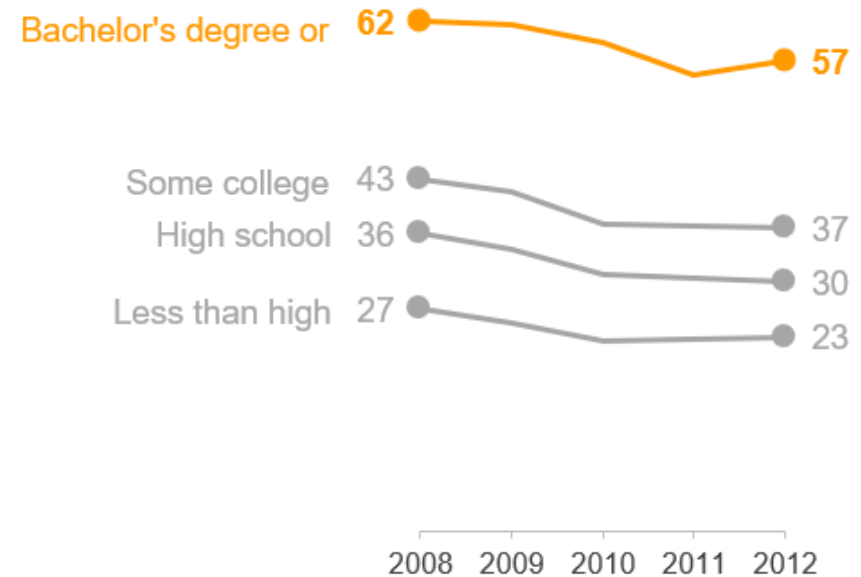
Note: Marriage eligible includes the newly married plus those widowed, divorced or never married at interview.

Source: US Census

Adapted from PEW RESEARCH CENTER

New marriage rate by education

Number of newly married adults per 1,000 marriage eligible adults



Note: Marriage eligible includes the newly married plus those widowed, divorced or never married at interview.

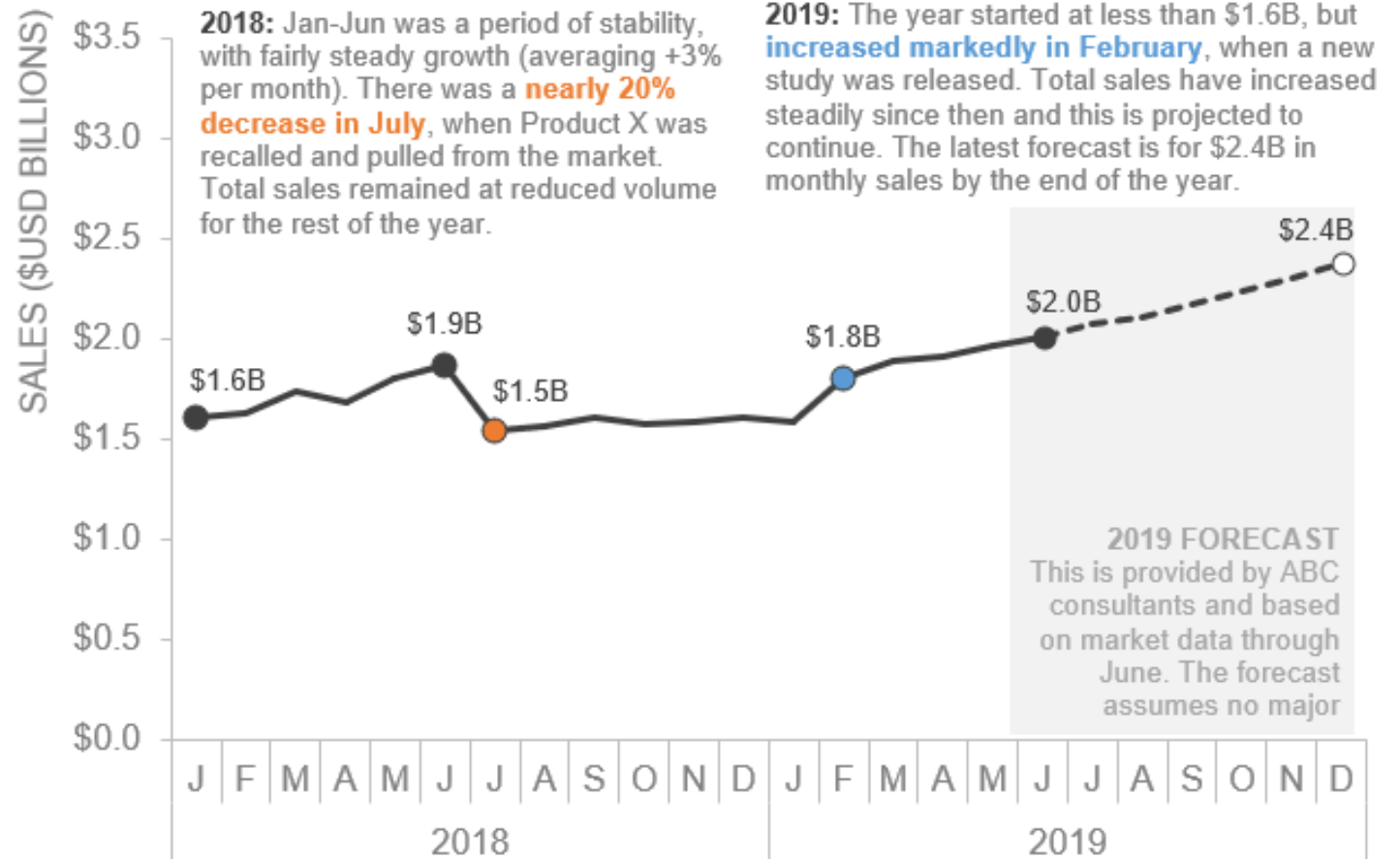
Source: US Census

Adapted from PEW RESEARCH CENTER

CREATE A VISUAL HIERARCHY

Use **color**, create **super categories** to bucket data sets, and apply **shading** to highlight forecasted data

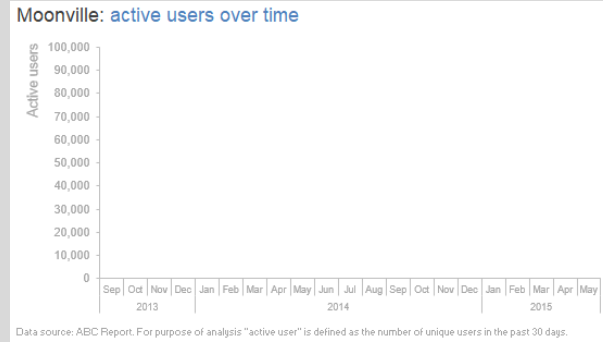
Market size over time



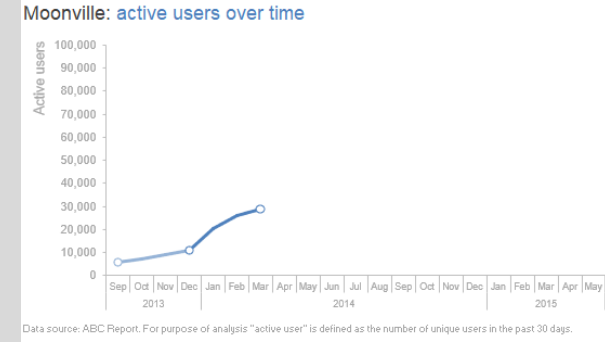
TELL A STORY USING ANIMATION

- Have a **plot**, some **twists**, and a **call to action** in order to create **tension**
- Live presentations allow you to “**walk**” the **audience** through the story of the visual
 - You build up to the overall results and conclusions over a **series of slides** or animation
 - However, a **standalone annotated version** is necessary
 - **Tells the story** without the voiceover
 - Ignoring these different needs can result in “**slideument**”
- Challenge is when you provide **too much data** at once, you lose your audience’s attention
 - **Leveraging animation** to walk the audience through the story is better
 - First step is to start with just a view of the **blank graphic**
 - Audience will have **to listen to you** to understand the finer details of what they are seeing

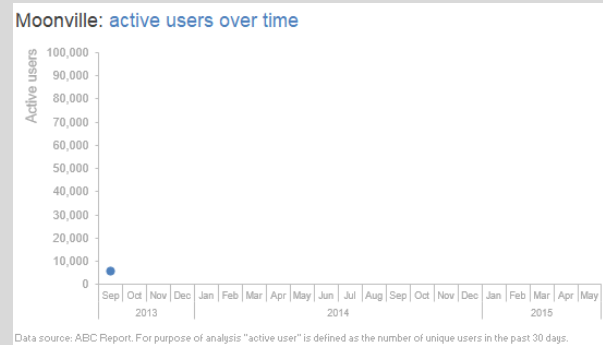
STORY PROGRESSION



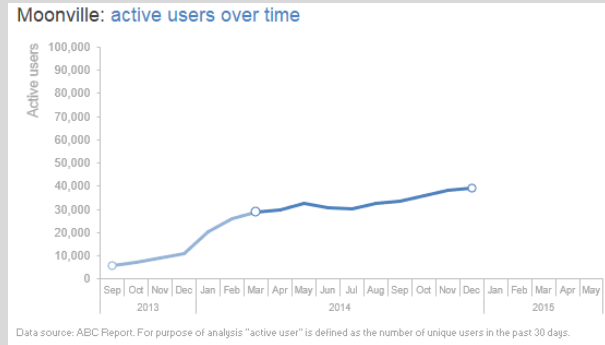
Build **anticipation** and retain audience's attention



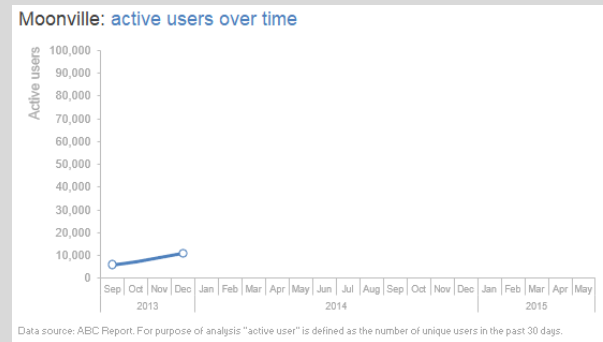
Users increased due to **friends and family promotion**



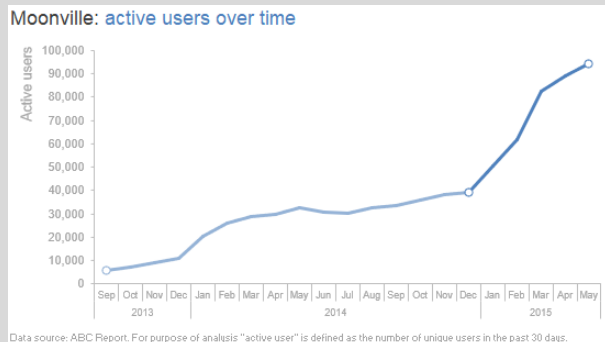
Blue dot is **starting point** for the story



Growth flattened during time when **game was updated**



Despite no marketing, # of **users doubled**



Revamped game and **social media** partnerships helped game to **go viral**

DETAILED ANNOTATED VERSION

Annotated version captures **salient points** made during live story telling

Moonville: active users over time



Data source: ABC Report. For purpose of analysis "active user" is defined as the number of unique users in the past 30 days.

TIPS FOR FINDING THE STORY IN YOUR DATA

- Data storytelling is part science and part art (like cost estimating!)
 - There are several **best practices** and **guidelines** to follow including
 - **Knowing your audience** and composing your story to meet their **needs**
 - Leveraging **Gestalt** design principles, using **preattentive attributes**, etc.
 - Rely on your artistic side to be **creative** and embrace **diversity**
 - There are **multiple options** for how you can **communicate** with data and have **fun**
 - **Explore** your data in **many ways** so you can discover the **stories** you need to tell
 - **Declutter** your visuals so that you **draw attention** to only what is most **important**
 - Push data **to the back** so it does not compete for the main message
 - Include only what is needed to **tell the story** making sure it is **easy to see** and **understand**
 - **Iterate** and seek **feedback** from peers

SEEK INSPIRATION THROUGH GOOD EXAMPLES

- Use these websites to inspire you as you create your presentations
 - Chart Chooser <http://labs.juiceanalytics.com/chartchooser/index.html>
 - Download as Excel or Powerpoint templates and insert your own data
 - Chartmaker Directory <http://chartmaker.visualisingdata.com/>
 - Explore the matrix of chart type by tool and click the circles to see solutions and examples
 - Graphic Continuum <https://policyviz.com/?s=graphic+continuum>
 - The poster includes more than 90 graphic types grouped into six categories
 - Also, check out the related Match It Game and Cards as well as three ways to annotate your graphs
 - Interactive Chart Chooser <https://depictdatastudio.com/charts/>
 - Explore the interactive chart chooser using filters

EXPLORE ADDITIONAL RESOURCES

- With [Datawrapper](#), you can create visualizations like the one below from Let's Practice in minutes instead of hours!
 - https://www.datawrapper.de/_/FqaTB/
 - It's free to use and no sign-in is needed to try it out yourself
- With [Flourish](#), explore and explain your data with stunning visualizations and stories
 - <https://flourish.studio/features/>
 - Publish, present or download a free public version (No need to code or install software)
- With [Google Data Studio](#), unlock the power of your data with interactive dashboards and beautiful reports that inspire smarter business decisions
 - <https://datastudio.google.com/overview>
 - It is easy and free!