

# Introduction to Data Visualization

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BAN140 - Section NBB /NCC

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# Week Topics

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## Previous Week

- dissecting model visuals

## Current Week

- Lessons in storytelling

# lessons in storytelling

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**Chapter Seven: From Storytelling with Data: A Data Visualization Guide for Business Professionals**, Wiley, 2017

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# The magic of story

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# Introduction

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- When you see a great play, watch a captivating movie, or read a fantastic book, you've experienced the magic of story.
- Emotional response is the common denominator for great entertainment experiences

# The power of stories! - Red Riding Hood

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- Watch <https://www.youtube.com/watch?v=8EMW7io4rSI&t=1020> @ 17:00
- How is Red Riding Hood story relevant to data visualization?
  - The power of repetition
  - The magical combination of **plot-twists-endings** we can recall and retell



# Components in a story

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## ➤ Plot

- What context is essential?

## ➤ Twists

- What is interesting about the data and what it shows?

## ➤ Ending

- What do you want your audience to do?

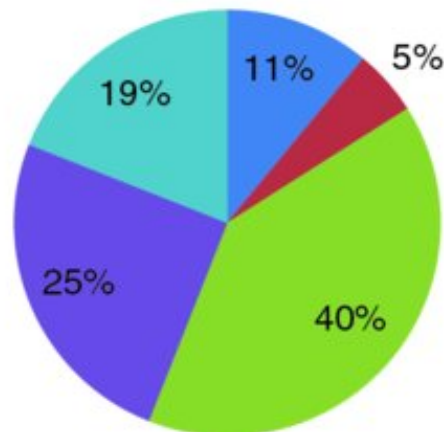
# BEFORE

If provided with a story, even a bad visualization can get the point across.

## Survey Results

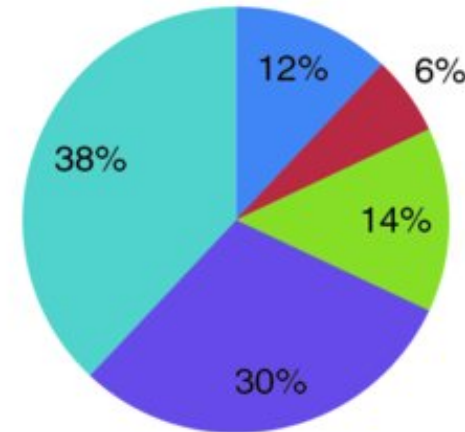
PRE: How do you feel about doing science?

■ Bored ■ Not great ■ OK ■ Kind of interested ■ Excited



POST: How do you feel about doing science?

■ Bored ■ Not great ■ OK ■ Kind of interested ■ Excited



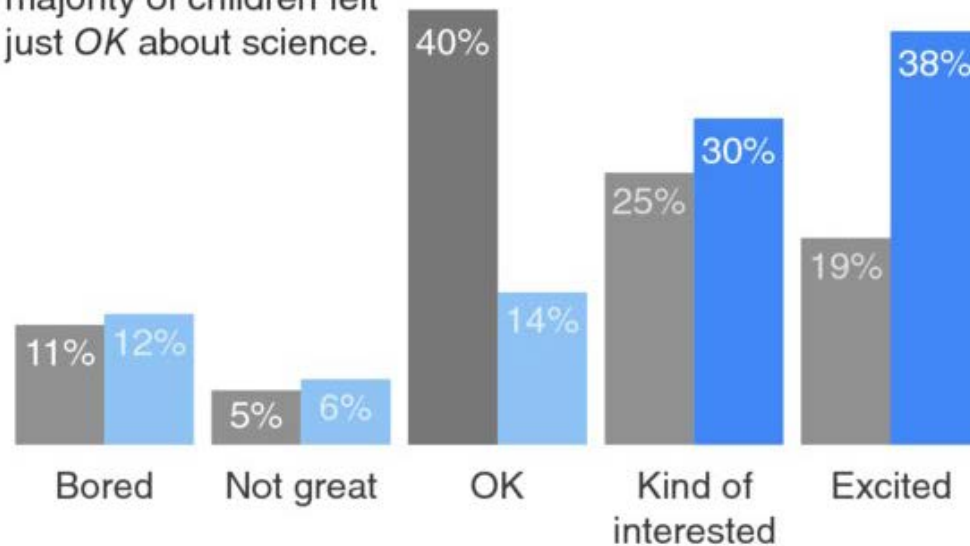
# AFTER

**The opposite is not true! Without a story, even a good visualization can fail!**

The summer learning program shows mostly positive impact on elementary school children's sentiments towards science. **We recommend continuing to offer it.**

How do you feel about science?

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



**AFTER** program, more children were *Kind of interested & Excited* about science.

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



# Storytelling in plays

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## ➤ Narrative structure

- First described by Greek philosophers such as Aristotle and Plato.
- Aristotle: every story has a clear beginning, middle, and end => three-acts
- Commonly referred to as the setup, conflict, and resolution.
- **Also: background, change, solution or answer (B, C, A)**

## ➤ The first act sets up the story.

- Introduces the main character(s), relationships, and their world
- After this setup, the main character is confronted with an incident, leading to a more dramatic situation. This is known as the ***first turning point***.



# Storytelling in plays (cont.)

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## ➤ The second act makes up the bulk of the story.

- The main character's attempt to resolve the problem, while lacking the required skills
- Finds himself encountering increasingly worsening situations
- This is known as ***the character arc***, where the main character goes through major changes in his life
- Learn new skills or reach a higher sense of awareness

## ➤ The third act resolves the story and its subplots.

- It includes a ***climax***, the tensions of the story reaching the highest
- Finally, the resolution

# Lessons for Data Visualization

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- Using the three-act structure as a model for communication
- Conflict and tension are an integral part of story.
- Need a resolution, suggestion, conclusion, or call to action



# Constructing the story – The beginning

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- Questions to consider to set up the story:
  - The setting: When and where does the story take place?
  - The main character: Who is driving the action?
  - The imbalance: Why is it necessary, what has changed?
  - The balance: What do you want to see happen?
  - The solution: How will you bring about the changes?



# Constructing the story – The middle

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- Ideas for content to include:
  - Further develop the situation or problem by covering relevant background.
  - Incorporate external context or comparison points.
  - Give examples that illustrate the issue.
  - Include data that demonstrates the problem.
  - Articulate what will happen if no action is taken or no change is made.
  - Discuss potential options for addressing the problem.
  - Illustrate the benefits of your recommended solution.
  - Make it clear to your audience why they are in a unique position to decide or drive action.



# Constructing the story – The end

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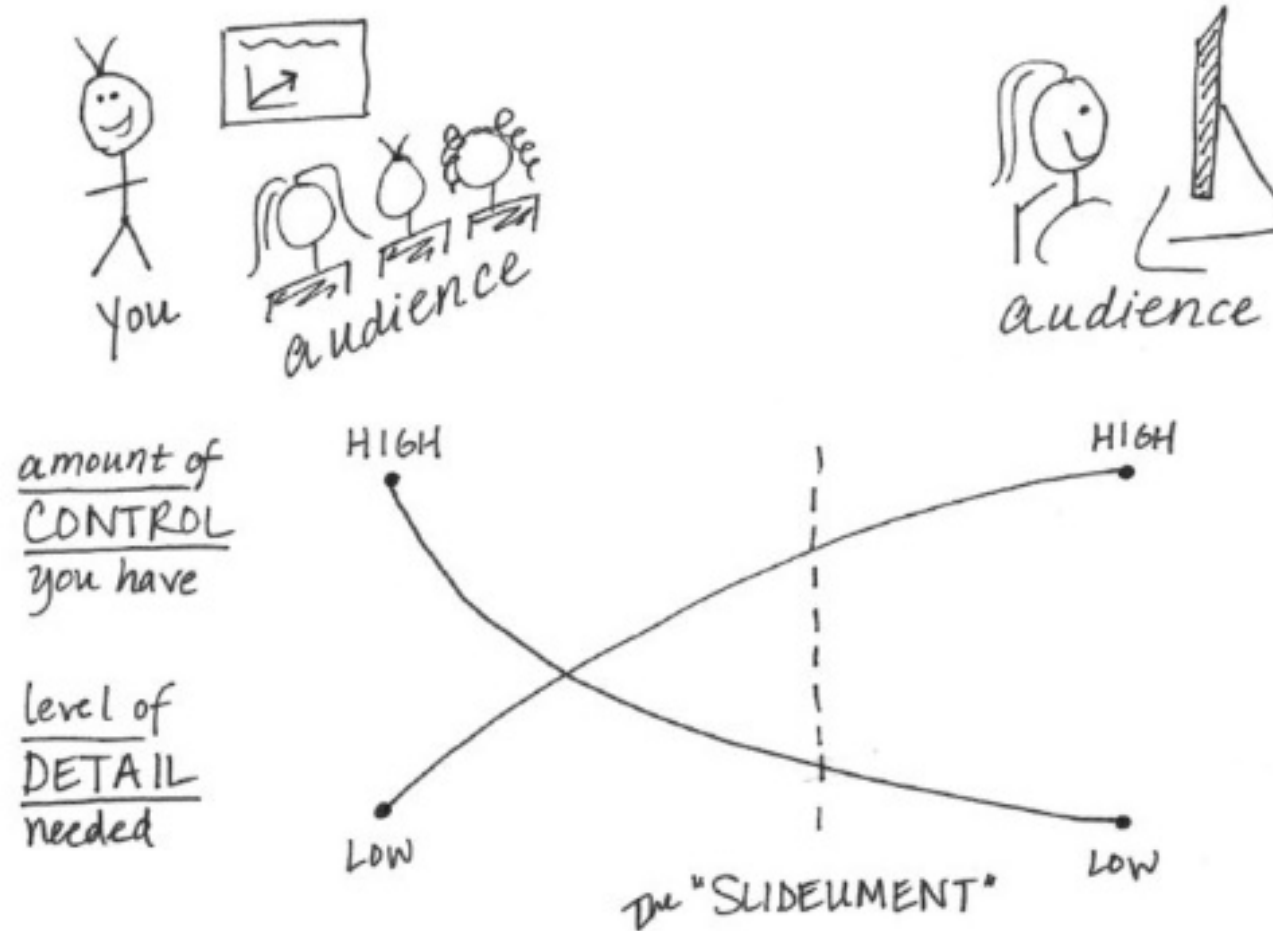
- End with a call to action:
  - Make it totally clear to your audience what you want them to do
- One classic way to end a story is to tie it back to the beginning (the problem). To wrap up, you can think about recapping this problem and the resulting need for action, reiterating any sense of urgency and sending your audience off ready to act.

# Tactics for a clear story on slides

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# Spoken vs. Written narrative

LIVE PRESENTATION . . . . . WRITTEN DOC OR EMAIL





# Which narrative flow works best?

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## ➤ **Chronological order**

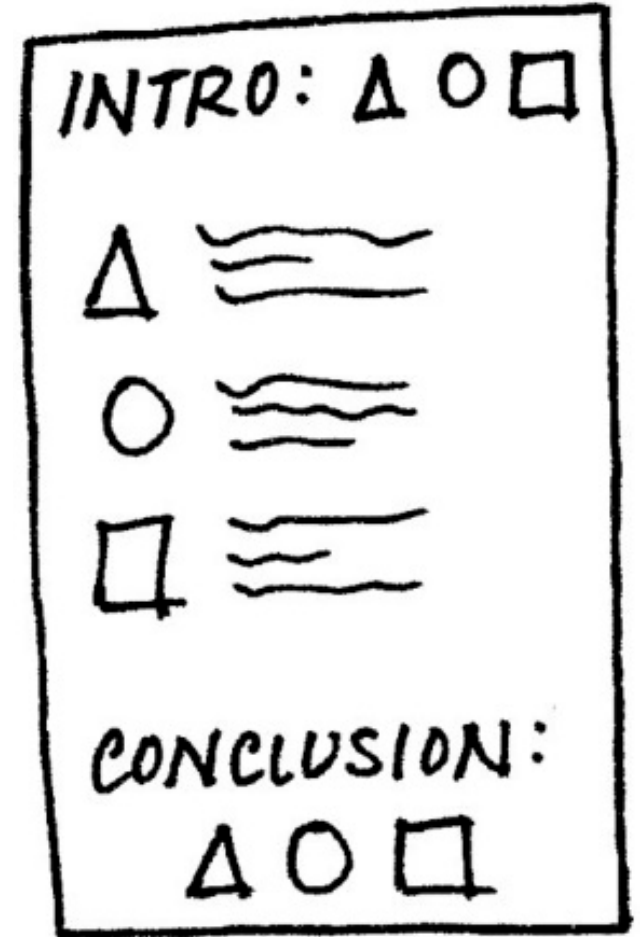
- Natural order, in the order things happened
- Need to establish credibility?

## ➤ **Lead with the ending**

- Start with the call to action
- Busy audience?

# The power of repetition

- Bing, Bang, Bongo Concept
  - **Bing- Introduction**
    - Tell your audience what you're going to tell them
    - For example, an executive summary or outline
  - **Bang- Content**
    - Then you tell it to them
    - Provide the details
  - **Bongo- Conclusion**
    - Then you summarize what you just told them
    - A summary slide or review the main points



# Tactics for a clear story

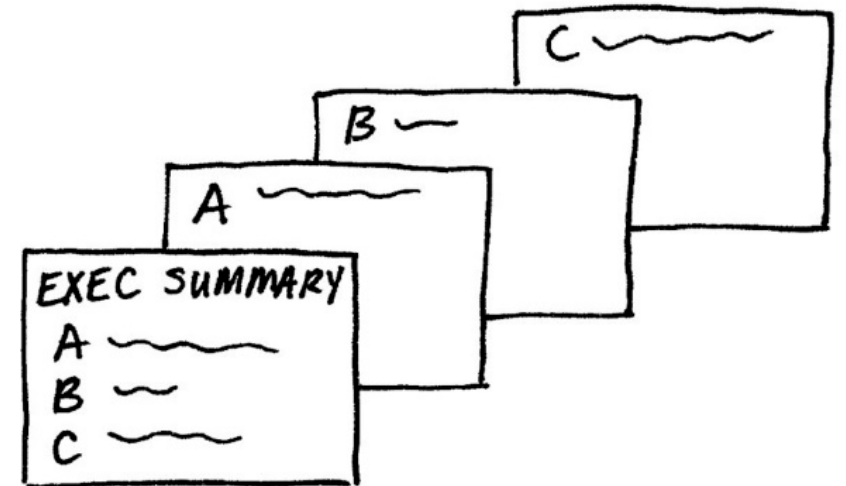
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## ➤ Four tactics:

- 1) Horizontal logic,
- 2) Vertical logic,
- 3) Reverse storyboarding,
- 4) And a fresh perspective.

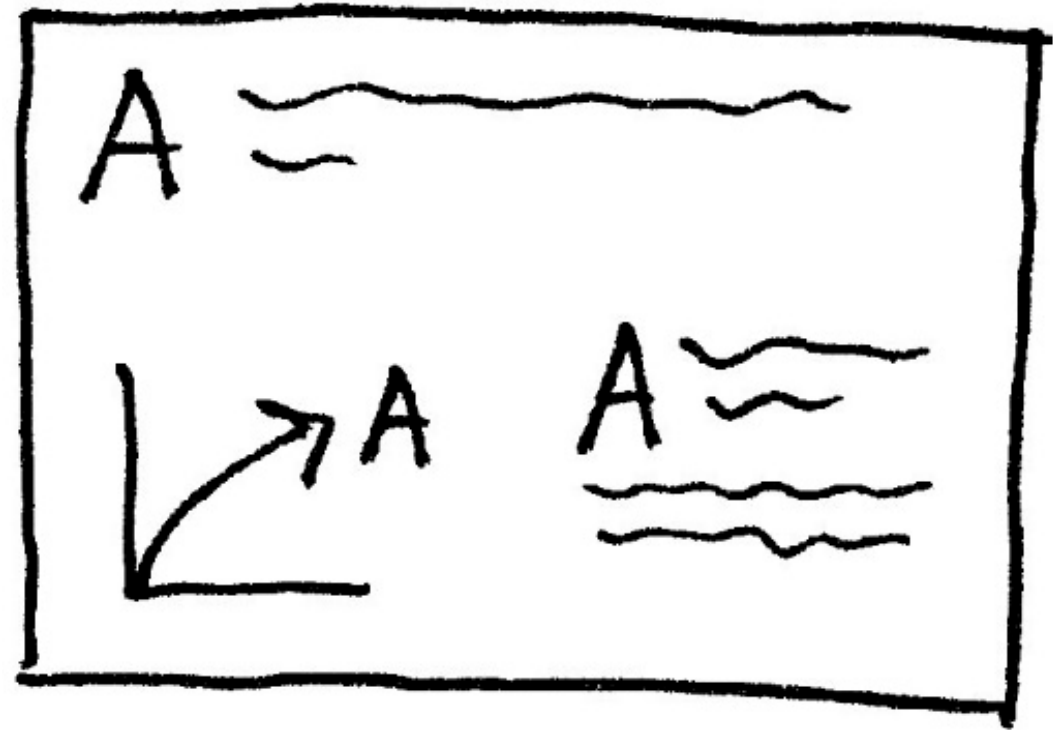
# Horizontal logic

- You can read **just the slide title** of each slide throughout your deck and, together, these snippets tell the overarching story you want to communicate.
- It is important to have action titles.



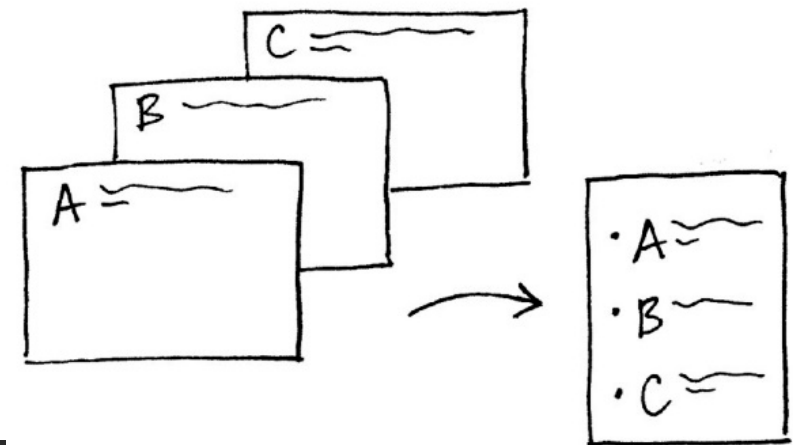
# Vertical logic

- All information on a given slide is self-reinforcing and relevant.
  - The title
  - The content
  - The visual



# Reverse storyboarding

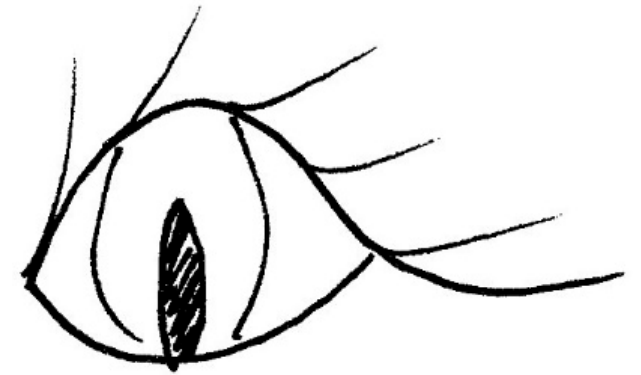
- If you take the final communication, flip through it, and write down the main point from each page, the resulting list should look like the storyboard or outline for the story.
- If not, need to add, remove, or move pieces/ slides.



# A fresh perspective

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- Give your draft to a friend or colleague
  - preferably someone without any context.
- Ask them to tell you
  - what they pay attention to,
  - what they think is important,
  - and where they have questions.



# More on storytelling

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- **The magical science of storytelling | David JP Phillips | TEDxStockholm**
- <https://youtu.be/Nj-hdQMa3uA>
  
- **Making data mean more through storytelling | Ben Wellington | TEDxBroadway**
- <https://youtu.be/6xsvGYIxJok>

# References and Resources

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- [Knaflic] Cole Nussbaumer Knaflic, **Storytelling with Data: A Data Visualization Guide for Business Professionals**, Wiley, 2017
  - Available online through Seneca Libraries: [https://senecacollege-primo.hosted.exlibrisgroup.com/permalink/f/t3376v/01SENC\\_ALMA5146374280003226](https://senecacollege-primo.hosted.exlibrisgroup.com/permalink/f/t3376v/01SENC_ALMA5146374280003226)
- [Ryan] Lindy Ryan, **Visual Data Storytelling with Tableau**, Pearson Addison-Wesley, 2018
  - Available online through Seneca Libraries: [https://senecacollege-primo.hosted.exlibrisgroup.com/permalink/f/t3376v/01SENC\\_ALMA5167006190003226](https://senecacollege-primo.hosted.exlibrisgroup.com/permalink/f/t3376v/01SENC_ALMA5167006190003226)
- [Healy] Kieran Healy, **Data Visualization: A Practical Introduction**, Princeton University Press, 2018.
  - Available (hardcopy) at Seneca Libraries: [https://senecacollege-primo.hosted.exlibrisgroup.com/permalink/f/t3376v/01SENC\\_ALMA2172469250003226](https://senecacollege-primo.hosted.exlibrisgroup.com/permalink/f/t3376v/01SENC_ALMA2172469250003226)
- **A Reader on Data Visualization:** [https://mschermann.github.io/data\\_viz\\_reader/](https://mschermann.github.io/data_viz_reader/)
- **Data visualization:** [https://en.wikipedia.org/wiki/Data\\_visualization](https://en.wikipedia.org/wiki/Data_visualization)
- **Section 5: Data concepts** <https://www.statcan.gc.ca/eng/dli/guide/section5>