**Edward Tufte**

* He is an analytical design theorist

6 principles:

1. Strive for graphical integrity

THE LIE FACTOR: How much you lie in your visualization.

* For example, in a bar chart you can divide the longest bar by the smallest and look if the result is correct according of their initial value.

1st PRINCIPLE

* The representation of numbers, as physically measured on the surface of the graph itself, should be directly proportional to the numerical quantities represented.
* So be careful with 3D

2nd PRINCIPLE

* Clear, detailed and thorough labelling should be used to defeat graphical distortion and ambiguity.
* Title, headline, legend + label if needed!
* (Explain what you are doing)

3rd PRINCIPLE

* Show data variation, not design variation

4th PRINCIPLE

* In time-series, displays of money is better with deflated and standardized units than nominal units (euro, dollar…)

5th PRINCIPLE => refer Bertin

* The number of information carrying (variable) dimensions depicted should not exceed the number of dimensions in the data
* Graphics must not quote data out of the context

1. Maximize data ink

1st PRINCIPLE: Above all else show data.

2st PRINCIPLE: Maximize the data-ink ratio.

3rd PRINCIPLE: Erase non-data-ink.

4th PRINCIPLE: Erase redundant data-ink.

5th PRINCIPLE: Revise and edit.

1. Avoid chart junk

The excessive and unnecessary use of graphical effects in graphs used to demonstrate the data.

1. Data density
2. Design solutions

* Small multiplies: series of the same small graph repeated in one visual.
* Sparklines
* Time series

1. Aesthetics & technique

* Have a properly chosen format and design
* Use words, numbers, and drawing together
* Reflect a balance, a proportion, a sense of relevant scale
* Display an accessible complexity of detail
* Have a narrative quality, a story to tell about the data
* Draw elements in a professional manner, with the technical details of production done with care
* Avoid content-free decoration, including chartjunk

CLUTTER:

* Don’t remove the data, change the design