10 Do not use colors (to be memorized)

Do not use colors if the reader has to memorize them. Do not use colors if you have to have a legend for every single color in order to understand the graphic. If no legend is required, then little thinking is needed in order to perceive the graphic. Too many colors in the graph take a huge toll on the attention capacity of the reader. One cannot remember all those colors because we can only remember a small set of things at once: five-seven. Also, colors do not have an intrinsic order, therefore they should not be used to sort things, unless you use value as well: darker color for more, lighter color for less, both being from the same hue or two diverging hues maximum.

11 Sort by value, not category

Sort by performance (value), not alphabetically. When part of the information is categorical but includes values for each category, do not sort the categories alphabetically. Instead, sort by the values for each of those categories. For example if the categories are products or states and each is a value, sort by the value, not by the alphabetical names of the states or the names of the products.

12 Equally space time intervals in timelines

Keep the spacing equal (for equal periods of time) even if that results in big information gaps within certain periods of time. Gaps are as meaningful as periods of concentrated activity. When data is concentrated within a few years, use typography and other means to make everything readable while keeping the temporal spacing even and correct.

13 Avoid meaningless concept maps

Avoid meaningless concept maps and network graphs. For a simple reason: they include on the page too many items and abstract concepts at once. Our working memory (short-term memory) allows us to hold in memory only a few items (4-7) for a very short time (2-4 seconds) before we have to move on. Concept maps look very cool but they are also very uninformative and little information is retained from them in our long-term memory. Generally, the thing one remembers from them is their vague visual form – the shape of the graph – rather than the more important subject matter.

14 You can use small type

You can use small type in a big poster. Use as many sizes as needed. A range from 16-18pt to 24pt is the best size range for most text on a poster, excluding the main title and possibly the subtitle, with even smaller sizes for captions and labels. For short texts, use 24pt. Sometimes 30pt for larger text can be used. In general, imagine that you’re standing 20 to 30 inches from the poster. At this distance, you should be able to read most text elements in the layout.

15 Do not screen type

Every font is a wonderful and beautiful universe unto itself. Do we really need to tinker with what is already a very sophisticated sign system? Do not reverse, screen (make tints), border, condense or expand type. Do not italicize type by pressing the “oblique” button. Use a font that already has a wide range of weights. Traditional old-style italic fonts are best to save space if needed, as they are naturally condensed and were designed for this purpose. Do not let your text lines run longer than two-and-a-half times the alphabet – about 60 characters. Break up the big text boxes into two or more columns whenever necessary so that your measure (box width) is “measured” and correct. Do not justify text if possible, use flush left/ragged right (FL/RR).

16 Psychology of perception

Be aware of the following terms related to cognitive psychology and psychology of perception: working memory, co-construction of meaning, background knowledge, conventions of representation, cultural (visual and verbal) conventions, context, genre, the annotation layer, closure.

For more information about the terms above, read my two papers:
The Four-Second Window
The Double Constraints of Convention and Cognition in Successful Graphic Design
http://bit.ly/2Dy2z8

Visit ULRs to download the PDFs of the articles.

Small Handbook of Information Design: 16 Principles for Better Data Visualizations

01 Use pencil and paper
02 Content is first
03 Do not draw graphs by hand
04 Do not enlarge numbers
05 Use words, not just images
06 Use small multiples
07 Do not bungie the meaning
08 Do not create op-art
09 Do not use little dots for numbers
10 Do not use colors (to be memorized)
11 Sort by value, not category
12 Equally space time intervals in timelines
13 Avoid meaningless concept maps
14 You can use small type
15 Do not screen type
16 Psychology of perception

Pino Trogu

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San Francisco State University
College of Liberal and Creative Arts
Department of Design and Industry
DAI 523 Information Design 1: Data Visualization
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For more copies of this booklet:
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For more info visit: www.edwardtufte.com
Thanks (and apologies) to my students for showing details from their various projects
In the early and later phases of a project, simply use pencil and paper as your design tools, use graph paper if needed, to sketch ideas, try out designs, and work out your proposal. Work on your ideas and your concepts by sketching your visualizations. Solve problems through sketching by hand, not by staring at a computer screen.

Content is first, form is second. Select interesting content. Content-less stuff produces form-less, uninformative visualizations. This means that you need one or more data sets that are rich with data. Many columns and many rows (lots of data points) are better than just two data points. For example, two percentages: 25 and 75 are in themselves not very interesting and it would be hard to pull off an interesting visualization based on just those two numbers.

Do not enlarge numbers. Do not turn data points into stand-alone enlarged numbers with a percentage sign next to them to make them look important. Filling up your visualization with such “visuals” is not any better, and might in fact be worse, than just having plain text, with no “visualizations” at all. An infographic is not a PowerPoint template. The best thing to do is to combine words and images together.

Do not create op-art (optical art) effects by using bold condensed sans-serif fonts where the strokes are the same width as the counters in the font and also the width of the spacing between the letters. This creates a very annoying, vibrating choppy and fuzzy effect. Do not use solid backgrounds, boxes, thick borders, or arbitrary bold type. If you are using solid background throughout, invert the whole image to see if it’s better with the opposite values. On a Mac, use control-option-command-8 to instantly invert the colors of your screen on the computer. See if it would be better the other way around (black type on white background). If nothing is gained by the solid fills, then get rid of them.

Content is first, form is second. Select interesting content. Content-less stuff produces form-less, uninformative visualizations. This means that you need one or more data sets that are rich with data. Many columns and many rows (lots of data points) are better than just two data points. For example, two percentages: 25 and 75 are in themselves not very interesting and it would be hard to pull off an interesting visualization based on just those two numbers.