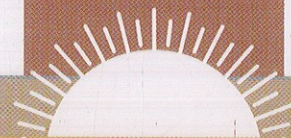
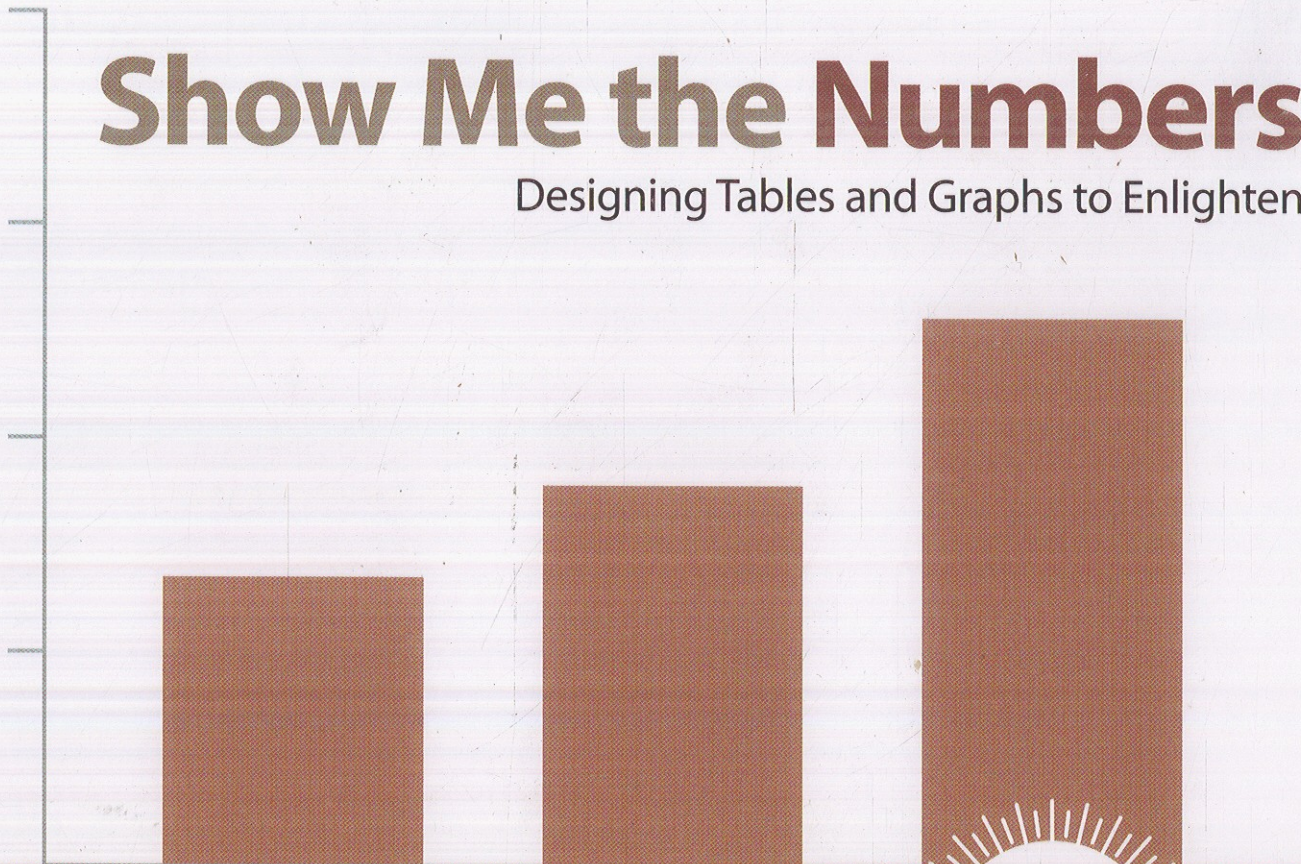


Show Me the Numbers

Designing Tables and Graphs to Enlighten



Stephen Few

CONTENTS

1. INTRODUCTION	3
<p>The use of tables and graphs to communicate quantitative information is commonplace in business today, yet few of us who produce them have learned the design practices that make them effective. This introductory chapter prepares the way for a journey of discovery that will enable you to become an exception to this unfortunate norm.</p>	
Purpose	9
Scope	10
Intended readers	12
Content preview	12
Communication style	13
2. NUMBERS WORTH KNOWING	15
<p>Quantitative information forms the core of what businesses must know to operate effectively. The current emphasis on business metrics, Key Performance Indicators (KPIs), and Balanced Scorecards demonstrates the importance of numbers in business. The messages contained in numbers are communicated most effectively when you understand the fundamental characteristics and meaning of the numbers that are commonly used in business, as well as the fundamental principles of effective communication that apply specifically to quantitative information.</p>	
Quantitative relationships	15
Numbers that summarize	21
Measures of money	35
3. FUNDAMENTAL CONCEPTS OF TABLES AND GRAPHS	38
<p>Tables and graphs are the two basic forms for communicating quantitative information. They have developed over time to the point where we now thoroughly understand which works best for what type of information and why. This chapter introduces tables and graphs and gives simple guidelines for selecting one form over the other.</p>	
Quantities and categories	39
Tables defined	40
When to use tables	41
Graphs defined	42
A brief history of graphs	43
When to use graphs	44

4. FUNDAMENTAL VARIATIONS OF TABLES	47
Tables are structured according to the nature of the information they are meant to display. This chapter breaks tables down into their fundamental variations and gives simple rules of thumb for pairing your message with the best tabular means to communicate it.	
Relationships in tables	47
Variations in table design	51
Table design solutions	53
5. FUNDAMENTAL VARIATIONS OF GRAPHS	55
Different types of quantitative relationships require different forms of graphs. This chapter explores the fundamental variations of graphs that correspond to different relationships and then teams these variations with the visual components and techniques that can be used to communicate them most effectively.	
Encoding data in graphs	55
Relationships in graphs	65
Graph design solutions	69
PRACTICE IN SELECTING TABLES AND GRAPHS	88
Learning requires practice. Through practice you will reinforce what you've learned by embedding it more securely in your memory and strengthen your ability to make connections between the concepts we've examined and their application to the real world.	
6. VISUAL PERCEPTION AND QUANTITATIVE COMMUNICATION	92
Quantitative communication, especially in the form of graphs, is predominantly visual. Thanks to science, how you see is fairly well understood, from the initial stimulus that enters your eyes to the interpretation of the information in the gray folds of your visual cortex. By understanding visual perception and its application to the communication of quantitative information in particular, you will learn what works, what doesn't, and why. This chapter brings the principles of visual design for communication alive in ways that are practical and can be applied skillfully to real-world challenges.	
Mechanics of sight	93
Attributes of preattentive processing	98
Application of visual attributes to design	101
Gestalt principles of visual perception	110
7. GENERAL DESIGN FOR COMMUNICATION	117
Based on an understanding of visual perception, you can build a set of visual design principles, beginning with those that apply equally to tables and graphs. The primary objective of visual design is to present content to your readers in a manner that highlights what's important, arranges it for clarity, and leads them through it in the sequence that tells the story best.	
Highlight the data	117
Organize the data	120
Integrate tables, graphs, and text	125

8. TABLE DESIGN	131
Once you've determined that a table should be used to communicate your message and the type of table that will work best, you must refine your design so that the table can be quickly and accurately understood and used by your readers.	
Structural components of tables	131
Best practices of table design	134
PRACTICE IN TABLE DESIGN	160
Nothing helps learning take root like practice. You will strengthen your developing expertise in table design by working through a few challenging real-world scenarios.	
9. GENERAL GRAPH DESIGN	166
The strong visual nature of graphs requires a number of unique design practices. The volume and complexity of quantitative information that you can communicate with a single graph are astounding but only if you recognize and avoid poor design practices that undermine your message.	
<i>Maintain visual correspondence to quantity</i>	166
Avoid 3D	170
10. COMPONENT-LEVEL GRAPH DESIGN	175
A number of visual and textual components must work together in graphs to communicate quantitative information. If these components are out of balance or misused, the message suffers. For each component to serve its purpose effectively, you must understand its <i>role and the design practices that enable it to fulfill its role with precision and grace.</i>	
Data component design	176
Support component design	207
11. DESIGN SOLUTIONS FOR MULTIPLE VARIABLES	217
Graphs can be used to tell complex stories. When designed well, graphs can combine a host of data spread across multiple variables to make a complex message accessible. When designed poorly, graphs can bury even a simple message in a cloud of visual confusion. Excellent graph design is much like excellent cooking. With a clear vision of the end result and an intimate knowledge of the ingredients, you can create a whole that nourishes and inspires.	
Combining multiple units of measure	217
Combining multiple graphs in a series	219
PRACTICE IN GRAPH DESIGN	231
You've come far in your exploration of graph design. It's now time for some practice to pull together and reinforce all that you've learned. Expert graph design requires that you adapt and apply what you've learned to a variety of real-world communication problems. Working through a few scenarios with a clear focus on the principles of effective graph design will strengthen your expertise and your confidence as well.	

12. THE INTERPLAY OF STANDARDS AND INNOVATION	237
When you design tables and graphs, you face a multitude of choices. Of the available alternatives, some are bad, some are good, some are best, and others are simply a matter of preference among equally good choices. By developing and following standards for the visual design of quantitative information, you can eliminate all but the best choices once and for all. Doing so dramatically reduces the time it takes to produce tables and graphs as well as the time required by your readers to make good use of them. Doing so sets your skills and creativity free to be used where they are most needed.	
APPENDICES	239
Table and Graph Design at a Glance	239
Recommended Reading	241
Adjusting for Inflation	242
Constructing Correlation Bar and Paired Bar Graphs with Microsoft Excel	244
Answers to Practice in Selecting Tables and Graphs	245
Answers to Practice in Table Design	248
Answers to Practice in Graph Design	255
INDEX	263