TAKE CONTROL OF

NUMBERS

Input, calculate, sort, filter, format, and chart data in

NUMBERS FOR MAC

by SHARON ZARDETTO

$14.99

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Want to get more out of Apple’s Numbers app? This book’s for you! You’ll learn everything from the basic interface to the construction of intricate formulas; how to shuffle data around, and sort and filter it simply or with complex rules; and how to create tables and charts.

If you want to share this ebook with a friend, we ask that you do so as you would with a physical book: “lend” it for a quick look, but ask your friend to buy a copy for careful reading or reference. Discounted classroom and Mac user group copies are available.

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What’s New in Version 2.2

Sometimes it’s difficult to keep up with Apple’s app updates. Within days of the original release of the second edition of this book, for instance, Numbers jumped from version 4.3 to 5.0, which we were able to accommodate with a swift update (to version 2.1) of this book. Since then, there have been several minor Numbers updates for “stability and performance improvements,” as well as tweaks to existing features and/or the addition of minor but convenient features. Numbers 5.3 presented a major new feature—Categories (known in the Excel world as Pivot Tables)—along with some other tweaks and additions. We were in the final editing phase of our update about that when Apple polished up a few more things and released Numbers 6.0. In all, a wonderful, if frustrating, example of coevolution. As far as I’m concerned, the jump to 6.0 was deserved for the addition of Categories, and not for what’s been tweaked since, but it’s now at the version number it deserves.

The major additions to this book since the last version are:

- **The Organize inspector:** This provides access to the pre-existing Sort and Filter tabs, as well as the new Categories capability. I talk about the inspectors in general in The Sidebar and Inspectors.

- **Categories:** Numbers’ answer to Excel’s pivot tables is covered in Analyze Data with Categories.

- **Import and export improvements:** The vastly improved importing of CSV and other delimited text files is described in Import and Export Delimited Files. Major improvements for importing and exporting Excel files are described in Exchange Files with Excel, and Handle Fixed-Width Files is new.

- **Voice recordings:** Create Voice Recordings on a sheet for your own reminders, or for comments or instructions to someone else.
Other additions and changes for this version include:

- **Chart-tweaking:** There’s always more to formatting charts, so you can learn how to: use and format leader lines (that’s in a list in The Pie and Donut Chart Tabs); tweak your data presentation by adding Reference Lines (my favorite new small feature); adjust Value-Label Angles; and round the edges of bars and columns (Format Charts).

- **Data Redistribution:** The procedure I previously described for redistributing data in unmerged cells no longer works, so I’ve provided a new method, described in Unmerged Data Redistribution.

- **Shapes:** Have you ever wondered why those million or so shapes in the Shape menu are frequently, but not always, blue, and wished you could set a starting-out color for different sheets? Read The Color of Shapes. And as if 1000+ built-in shapes weren’t enough, you can Save a Custom Shape to the Shape menu.

What was new in version 2.1 of this book:

- The (then) new chart in town: the donut. Read about it in Choose the Right Chart and the renamed and expanded The Pie and Donut Chart Tabs.

- A new section in the Import, Export, and Share Files chapter, “Convert Delimited Files,” described Numbers’ new capability of importing more than just the tab- and comma-delimited text files it could always handle. (However, that information has been updated again, since the capabilities have changed, and the section is now called Import and Export Delimited Files.)

- A section on how to Use Image Galleries—little slide shows whose images have searchable captions—on your sheets.

- **Tabbed Windows** (a feature that existed in the previous Numbers version, but one I hadn’t covered) explains how to corral multiple open documents into one easy-to-manage window.
Introduction

When tax software came out for the Mac, I ignored it for several years. And my return was not all that simple, what with self-employed forms to be filled out, as well as those for dependent childcare expenses, and so on. No, I didn’t like working on paper. Nor did I skip my taxes.

Instead of canned tax software, I had my spreadsheets. They looked like the tax forms, with text on each line, and a cell in the right margin to hold the numbers. I enjoyed setting up the interlocking of those cells, since a formula could refer to cells elsewhere on the sheet—and on other sheets. I could fill out the Business Use of a Home worksheet, and its total was reflected in a list of deductions on Schedule C, which was used to calculate the annual profit, which was used to figure the Social Security tax.... Okay, so I’m sorta geeky. But it led me to exploring the ins and outs of Numbers (in a migration from Excel), which eventually led me to sharing the results of my explorations with you.

Are you new to spreadsheet software, to Numbers in particular, or to Numbers 6? Have you had time to only skim the surface of the app but want to be more proficient? Are your formula-building skills limited to SUM and AVERAGE but you need more from your data? Do you wonder if it matters whether you use a line chart or a bar chart (it does!), or when a pie chart is the way to go? At the risk of sounding like an infomercial: If you answered “yes” to any of these questions, this book is for you. If you have other questions, this book is for you. If you don’t even know what questions to ask, this book is for you.

This book is about Numbers 5 on a Mac running Mojave (macOS 10.14.x). It does not specifically cover Numbers in iCloud (check it out by signing in at iCloud.com and clicking the Numbers icon) or on iOS devices. Almost all the information in this book, however, is directly applicable to Numbers for iCloud because Apple made a concerted effort to match the interfaces of the web and Mac versions. The fundamentals in this book, such as how to construct formulas, which charts to use for what kind of data, and filtering and sorting data, also apply.
to the iOS version; and you’ll be surprised—I know I was—to see just how much of the information here is directly relevant to the iOS version. Sometimes you have to simply translate “click” to “tap.” Elsewhere, it helps if you’re versed in the iOS interface so that you’re comfortable tapping around to find pop-up menus, or working in popovers instead of the inspector sidebar.

P.S.: Yes, I use tax software now. But I work with the forms, not just reply to an “interview” and let everything get done behind my back. I still like knowing where my numbers go, and putting them there myself.

Just a few more things before we dive in:

- If you’re new to the Mac, you can review basics that might help with some of the tasks in this book (such as using Cut, Copy, and Paste, and saving documents) in Tonya Engst’s ebook *Take Control of Mac Basics*.

- When I refer to using mouse options or trackpad gestures, I usually assume their default settings; yours may be different. They can be adjusted in System Preferences > Mouse (or Trackpad).

- The Mac’s *shortcut menus* disdain the menu bar in favor of almost anything else: one might be opened from almost any element in a window, or even from the bare desktop. They’re also called *contextual menus*, a description that pre-dates Apple’s current nomenclature. Their existence is usually totally hidden until you hover near a trigger spot, at which point a tiny menu indicator (✓) might appear, usually pointing down or to the right; clicking on, or very near, the indicator opens the menu. But you don’t need the indicator: a Control-click in the area where it would appear opens the menu. You can set an alternate shortcut-menu trigger in System Preferences > Mouse (or Trackpad), where it’s referred to as a *secondary click*. Since a Control-click works no matter your input device or preference setting, that’s the term I use throughout this book.
Beginning at the beginning is not always what a reader needs. Here are some areas that you might want to check out first.

**Get started:**

- Read in-depth coverage of Numbers’ basics in Learn Terminology and the Interface, Work with Sheets and Templates, Review Table Basics, and Master Cell Basics.

- If you’re new to spreadsheets in general, also check the Learn the Anatomy of a Table, read Cell Referencing 101, and Learn Data Entry Basics.

- If you’re new to Numbers, but comfortable with spreadsheets, you’ll find these topics especially helpful: Manage Sheets, the Template Chooser, and Use Pop-Up and Contextual Table Menus. And you’ll love learning how to Analyze Data with Categories.

**Work more efficiently:**

- First, Customize Your Environment.

- Keep your frequently used document setups instantly available: Use Built-In and Custom Templates.

- Speed Data Entry with Autocomplete, and Type in Shorthand with Text Substitution when you can. Speed Data Entry with Autofill, and Use Special Data-Input Options: Create Checkboxes, Set Up Star Ratings, Build Pop-Up Menus, and Define Sliders and Steppers.

- Don’t waste time recreating formatting combinations. Make Custom Templates for documents, Use Table Styles, Use Paragraph and Character Styles, and even Define a Default Text Box.

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Work with formulas and functions:
• If you’re new(ish) to spreadsheets, you should Master Cell Basics, Learn Formula-Building Basics, Cell References, and Understand Functions and Arguments.
• Learn how to Work in the Formula Editor and then Explore the Function Browser.
• To enter common formulas quickly, Use Quick Calculation Tokens.
• If you know basic formula and function usage, and want to broaden your knowledge, read Nested Functions and Master IF Statements and Logical Operators.

When looks matter:
• A table can look both businesslike and friendly when you know your formatting options. See Apply Table Formats, Apply Basic Cell Formats, Review Standard Data Formats, and Create Custom Data Formats.
• Standardize the look of components in tables and sheets with styles: Read Use Table Styles, Use Paragraph and Character Styles, List Styles, and the chart style information at the end of the The Chart Tab topic.
• Keep things shipshape on a sheet by using Rulers and Ruler Guides and learning to Work in the Arrange Tab.
• Add graphical elements to a sheet as described in “Drawing” Shapes, and create free-standing labels using Text Boxes.
• Conquer Color Controls for everything from text to cell borders to shapes.

Get more information out of your information:
• Look at your data in a whole new way when you Make Interactive Charts.
• Look at your data in a whole new light when you Analyze Data with Categories.
• Add extra statistical data (that doesn’t even appear in your table) to a chart with Reference Lines.

**Visualize data with charts:**
• Get the basics in Learn Chart Parts and Terminology and Choose the Right Chart, and then learn how to Create a Chart.

• Work with the special chart options: Design 3D Charts and Make Interactive Charts.

**Work with other people:**
• When “other people” are Numbers users, learn to Share and Collaborate and Add Comments—and maybe Create Voice Recordings for more explicit instructions. When they are not, learn how to Import, Export, and Share Files.
About Numbers

This chapter describes how to buy Numbers and stay updated, helps you Learn Terminology and the Interface, and explains how to Customize Your Environment to suit your particular needs.

Get Numbers and Stay Up to Date

If you don’t already have Numbers, the question is: Why not? It’s been a free download since April 2017 (along with Apple’s other productivity apps, Pages and Keynote). To download Numbers:


2. Type numbers in the Search field. The Numbers app is likely to be the first item in the found list.

3. Click the Get button.

To update your copy of Numbers, go to the App Store. Click Updates in the sidebar or choose Store > Updates (⌘-7); find Numbers and click its Update button. If you have lots of updates waiting, you can use the search field to narrow the choices.

Tip: You can set up automatic updates for your software from within the App Store app. Choose App Store > Preferences, and select Automatic Updates, which downloads and installs updates when they’re available. (I much prefer controlling updates on an individual basis and at a time of my choosing.)

Learn Terminology and the Interface

Because an app’s terminology is inseparable from its interface, we take a quick look at both in this section.
Tables and Sheets

Numbers is not your [insert ancestor]’s spreadsheet program. Initially, a spreadsheet was a document with a grid of rows and columns. Today, while Numbers uses “spreadsheet” to refer to the document, that document can have multiple sheets, accessed by tabs in the window. Each sheet can hold multiple items, including text, charts, and pictures. Want a grid for your numbers? Put a table on your sheet.

The Sidebar and Inspectors

The sidebar is a major interface element in Numbers: it’s a panel on the right side of the window that displays inspectors, the Function Browser, or printing options. It shows a specific inspector when you click the Format ⌘ or Organize ⌘ button on the toolbar, or when you select either from the View > Inspector submenu. The Organize inspector replaced the previous Sort & Filter inspector in honor of the new Categories capability; you can access all three organizational tools—Sort, Filter, and Categories—in this conglomerate inspector.

**Tip:** Close an inspector with a click on its toolbar button or by selecting it again in the View > Inspector submenu (where the active inspector has a checkmark).

Each inspector has multiple tabs that provide setting options that change based on the current selection on the sheet. Some tabs have further divisions, unnamed by Apple but that I refer to as panes, accessed by buttons (Figure 1).
You can’t do anything in Numbers without working on a sheet—the blank canvas on which you place Numbers’ raison d’être: tables and their related charts, as well as fancier elements such as graphics and audio recordings. This chapter shows you how to create, name, and delete sheets, and how to use their tabs to manipulate multiple sheets in a document. Tabbed Windows describes a different kind of tab structure, one that makes juggling multiple open windows a thing of the past. Zoom In and Out explains how to get anything from a bird’s-eye view to an extreme closeup of your sheet. Finally, I show you how to Use Built-In and Custom Templates.

Manage Sheets

A Numbers document can have more than one sheet; each gets a tab immediately beneath the toolbar. Click the tab to display its sheet.

The tab also provides a menu; open it by pointing to the tab and clicking the menu arrow that appears, or with a Control-click anywhere on the tab. The menu conveniently lists all the tables and charts on the sheet, in order of creation (Figure 5); other objects, such as shapes and text boxes, are not listed. Choose an item to select it, and the window scrolls if necessary to display it; this works for any sheet, not just the current one.
Figure 5: A sheet’s pop-up menu lists objects on it, and provides several sheet-handling commands.

Tip: You can access the pop-up menu for any sheet, not just the active one. So, for instance, you can delete any sheet at any time.

Here’s what you can do in the sheet tab area:

• **Add a sheet:** Click the Add + button on the far left. (Alternatively, choose Insert > Sheet).

  Note: A new sheet always starts with an empty table, which uses the first of the table styles included in the document (see Use Table Styles).

• **Go to another sheet:** Click its tab or choose commands from the Window menu to go to the next, previous, first, or last sheet. If you prefer the keyboard approach, as I do, use Command-Shift-[ and Command-Shift-] to move to the previous and next sheet.

• **Reorder sheets:** Drag a tab to a new position.

• **Scroll the tabs:** Use the arrows < > at the right of the sheet tabs; the arrows appear when the tabs overflow the width of the window. On a trackpad, use a two-finger swipe when your pointer is over the bar (unless you’ve changed that default in System Preferences).
Review Table Basics

Tables are the *sine qua non* of spreadsheet applications, so it’s important that you understand the basics of table handling, whether you’ve never used a spreadsheet app or are accustomed to the Excel or Google Sheets approach where *table*=*spreadsheet*=*table*.

In this chapter, I start with nomenclature for the parts of a table, and then cover how to Create and Control Tables. After describing how you Use Pop-Up and Contextual Table Menus and Name a Table, I show you how to Manipulate Rows and Columns, which covers important skills such as inserting, deleting, resizing, and hiding them.

**Note:** When it comes to the next (granularly speaking) element in tables, there’s so much to cover that it has its own chapter, *Master Cell Basics*.

---

**Learn the Anatomy of a Table**

When you choose File > New and open a Blank template, it has one sheet (a tab), with a single table on it. The table is surrounded by various interface elements; when cells are selected, you see even more. Although Apple seems allergic to naming all the interface elements, we need names so we can talk about them, so I’ve fabricated some for our mutual convenience (**Figure 9**).
**Figure 9:** I use this terminology to talk about table elements. This figure is a composite—not all these controls are available at the same time in Real Life.

---

**Create and Control Tables**

If you didn’t need tables, you wouldn’t need Numbers. And because they are the crux of the work you do in Numbers, you need to know how to create, select, move, delete, resize, and name them. But to do most of those things, you must be able to recognize a table’s state.

**Learn Table States**

A table can be in one of four states, depending on what you’re doing with it. What difference does the state make? Well, for one instance, if you press Delete when a table is active, you delete the contents of any currently selected cells, while pressing Delete when the table is selected deletes the table itself. In addition, there are some things you can do only when a table is active, and others only when it’s selected. **Figure 10** shows what the four states look like.
Master Cell Basics

You’ll be spending lots of time selecting cells and moving around in tables, so knowing how to select and Move Between Cells and Move Within a Block of Cells can save a lot of time. This chapter also covers how you can Move a Cell or Its Data and Merge and Unmerge Cells (including what happens to the data when you do either).

Cell Referencing 101
You’ve probably already realized that a single cell is named, Bingo-like, for its column and row: B2, E6, and so on. Multiple cells in a group (referred to variously as a block, range, array, or collection) are named for the top-left and bottom-right cells, with a colon between: A2:A6 or B5:D10, for instance. (See Cell References).

Select Cells

To select a cell, just click it. (Selecting its contents takes another click: read Learn Data Entry Basics). Once selected, a cell’s ready for action: type something and it goes in the cell, press Delete and the cell contents disappear. To select more than one cell:

- **Drag**: Drag across contiguous cells to select them.
- **⌘-click**: ⌘-click any cell to add it to, or remove it from, the current selection; it doesn’t have to be contiguous with already-selected cells.
- **Selection handles**: Drag a white selection handle to enlarge or shrink a selection.
- **Shift-click**: With some cell(s) selected, Shift-clicking outside the selection adds cells, but what you wind up with depends on where you started. When you select a block of cells by dragging, everything is calculated from the cell that you click first. Drag-select the block A1:A3 by starting in A1, then Shift-click in A4, and you wind up with...
A1:A4 selected, just as you’d expect. But start by selecting A1:A3 with a drag upward from A3, then Shift-click in A4, and only A3:A4 is selected (as shown in Figure 21), because A3 is the initial cell, and the Shift-click selected everything from that cell to the Shift-click spot.

**Figure 21:** Adding to a selection with a Shift-click in A4. Left: Initial selection dragged from A1 to A3. Right: Initial selection dragged from A3 to A1.

- **Shift-move:** Alter a selection by adding Shift to any keyboard option that moves you from one cell to another (except for Tab and Return, which reverse direction when you add the Shift key). So, with the selection A1:A3 made by dragging from A1 to A3:
  
  - Pressing Shift-down arrow adds A4, the cell beneath the selection. If you started with a two-column selection, Shift-down arrow would add the two cells beneath that selection.
  
  - Pressing Shift-right arrow adds B1:B3 because it selects cells in the next column that are adjacent to the already selected cells.
  
  - Pressing ⌘-Shift-right arrow selects to the ends of the three rows.

Note that if you selected the original block by dragging in the opposite direction, your results would be different because they would be calculated from a different initial cell.

- **Entire rows or columns:** See Select Rows and Columns.

**Touch Bar Tip:** When you select a cells, the Touch Bar displays basic text and data formatting options, as well as a few shortcuts (such as for inserting formulas). I cover these options in the related topics.
Use Table Formats and Styles

Numbers offers many options for table formatting that can make a table easy to read—or turn it into an abomination to behold. When it comes to avoiding the latter, here’s my advice: Practice restraint!

I describe table format options, just below, that you can use to standardize a table’s look, and make its data easy to scan. With formatting skills under your belt, you can Use Table Styles to apply your perfect combo of formats to other tables, and Reorganize Styles to keep your most-used ones readily at hand.

Apply Table Formats

The four formatting choices that affect an entire table—gridlines, the table outline, alternating row color, and overall text-size alteration—are all accessible in the Format inspector’s Table tab. You can apply these to any active or selected table, or to multiple selected tables:

- **Gridlines:** Almost every table starts with cells delineated by gray gridlines. They can be switched on and off separately for body rows and columns, row and column headers, and footers (**Figure 30**).

![Gridlines](image)

**Figure 30:** The gridline buttons. Left: Horizontal and vertical lines for body cells. Right: Header columns, header rows, and footer rows.

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Tip: If you apply Cell Borders and later remove them, the gridlines beneath are likely to be gone, too. Getting them back is easy, but non-obvious. Select the area, go to the inspector’s Cell tab, click the appropriate gridline pattern from the Border choices, and choose Default Style from the Border Styles pop-up menu.

- **Table and name outline:** In the Table Outline section, choose a line style from the pop-up menu, select a color, and set the line thickness; add the same outline to the table’s name by checking “Outline table name” (**Figure 31**). (Default Table Style sets the outline back to what’s defined in the table’s style.)

![Figure 31: Use the Format inspector’s Table tab to create a custom table outline and to turn the table name outline on or off.](image)

- **Alternating row color:** To make a table more readable, shade alternate rows: check Alternating Row Color (near the bottom of the Table tab), and then choose from the color well. Shading doesn’t have to be subtle shades of gray—other colors can be subtle, too. (See the tip on creating subtle shades in Meet the Color Well.)

- **Proportional text-size adjustment:** If the text in a table includes more than one font size, you can proportionately enlarge or shrink all the text in a selected or active table by clicking the small or large Table Font Size A button. (If cells in the table are selected, the change is still applied to the entire table.)

In a selected (not active) table, you can use the shortcuts for Format > Font > Bigger and Format > Font > Smaller: ⌘-= (because of the plus sign on that key) and ⌘-- (that’s not a typo—it’s the minus sign).
Learn About Cell Formats

“Format” is a nebulous word when it comes to table cells because it can refer to different things. A cell’s format defines its look: the background fill, borders, and text attributes such as font and color. A cell’s format also describes how its data should look—whether there are dollar signs on the numbers, for instance.

In this chapter, I cover the details of basic cell formats—background fills and borders—and demystify the sometimes puzzling interaction between Cell Borders and Gridlines. I also explain one of my (and soon to be one of your) favorite features in Create Conditional Highlighting, which explains how to apply cell formatting based on its content.

Apply Basic Cell Formats

You can use borders and fills to subtly define areas of your table, or to make it look like Times Square at night—which can be a thrill in real life, but in a spreadsheet? Not so much.

Cell Borders

Most tables start with staid gray gridlines as part of the table style. But you can easily highlight areas of the table using cell borders, which trump gridlines wherever they are used. Design and apply borders with the options on the Format inspector’s Cell tab (Figure 33).

![Border controls on the Cell tab](image)

**Figure 33:** Border controls on the Cell tab: border patterns, menus for border and line styles, a color well, and stroke setting.
To apply borders to table cells:

1. Select the target area in the table.

2. In the Format inspector’s cell tab, click a pattern to define which lines in the selection you want formatted (Figure 34).

Figure 34: Border choices and their targets when six cells are selected: Outline, All Borders, Inside Borders, and Middle Borders. (Middle Borders can be vertical, too, depending on the initial selection.)

3. Select options from the border and line style menus (Figure 35).

Figure 35: The menus for border and line styles.

The Border Style menu has four sections:

- **Recent**: This applies the most recently used style, which is helpfully displayed in the menu.

- **Selected Styles**: This shows borders within the current selection; if nothing else, the table’s gridlines are an option.

- **Table Styles**: Choices here are those in the table styles used in the document.

- **Default Style and No Border**: Choosing Default Style returns selected cells to the gridlines defined in the table’s style. No Border removes not only borders you’ve applied, but also the underlying gridlines; restore them by choosing Default Style.
Control Data Input

Put data in a cell? Sure, just click in a cell and type—what else is there to know? Well, you can start with the many different types of data that Numbers recognizes and handles automatically, as described in Understand Automatic Data Formats, and how to Use Text Wrap in Cells when your cell runneth over.

And then there’s letting Numbers do more of the work for you, when you Speed Data Entry with Autocomplete and Speed Data Entry with Autofill. You can also do more than just a plain ol’ copy and paste: Explore Copy and Paste Options shows you how to leave a cell’s formatting behind if you want, for instance, to paste only the formatting in a new location.

Learn Data Entry Basics

To enter data, select a cell and type. This is convenient—you don’t have to click to put the blinking insertion point in the cell after you select it; but it can also be dangerous, because if there’s something in the cell, typing replaces what’s already there.

When a cell’s not selected, double-click it to edit the contents. Each cell is like a teeny-tiny word processor; when you are editing a cell’s contents, for instance, you can double-click a word to select it or drag across characters to select them.

You have to let Numbers know that you’ve finished typing before it can use your input to calculate formulas or do its auto-formatting tricks. Navigating to another cell takes care of that, but if you want to see formula results or auto-formatting applied before you leave the cell, press ⌘-Return to deselect the contents.

To erase all data from a cell, select the cell and press Delete. This works for a selected range of cells, too: you can clear multiple cells with a
single keypress. Comments are removed as well, but cell formatting, including its text formatting, remains “attached” to the cell.

**Graphics Are Not Data**

It *seems* that you can put an image in a cell: with an image on the clipboard and a cell selected, choose Edit > Paste and a tiny version of the image winds up in the cell. You can even paste in a video or audio file and its associated image shows in the cell. But the image is just background fill: the cell’s data appears on top of it. (Now that I’ve let that particular cat out of the bag, I’m counting on your not overdoing it.)

The image is no longer an independent entity—you can’t drag or copy it out of the cell. That’s because it’s not *data* any more; it’s just fill formatting, like color—which is why your cell data goes on top of it.

It’s not obvious how to get rid of a background image in a cell—unless you remember that it’s just a cell format at that point: select the cell and, on the Format inspector’s Cell tab, choose No Fill.

---

**Understand Automatic Data Formats**

In cells that have the default Automatic data format set on the Format inspector’s Cell tab, Numbers recognizes these data types:

- **Number**: When you finish entering a number, it’s right-aligned in the cell to reassure you that it’s been recognized as such.

- **Text**: Text is anything that doesn’t qualify as any of the other data types, so it includes pure text as well as mixtures of text, numbers, and/or symbols. Text is automatically left-aligned in a cell.

- **Dates and Times**: You can’t have a date without a time, or a time without a date; input one, and Numbers includes the other (although it’s not always displayed in the cell):
  - **Date**: Enter 5/23 and weekday, 5/23/[current year] 12:00:00 AM is stored.
  - **Time**: Enter 12:27, and [current date] 12:27:00 PM is stored.
Learn About Data Formats

Numbers lets you control two kinds of data formatting. There’s the data type: an entry of 3:02 could be a time, or a duration of 3 hours and 2 minutes, but formatting it specifically as a time or as a duration keeps things clear. And then there’s the data’s appearance: you enter 2, but it could be displayed as 2.0 or 200%; or, a date could show as December 10, 2001 or 12/10/01 or the European 10 December 2001.

In this chapter, I describe the standard data formats that Numbers recognizes and then show you how to Create Custom Data Formats, including how to use Alternative Formats with Rules to change a cell’s formatting based on the data in it.

Review Standard Data Formats

Use the Data Format pop-up menu on the Format inspector’s Cell tab to define the type of data in a cell—overriding Numbers’ automatic recognition of data types—and to control how it appears no matter how it was entered (Figure 51).

**Figure 51:** The Data Format pop-up menu in the Cell tab.

The menu offers five data types, bookended by an all-purpose default and a roll-your-own option:

- **Automatic**: This default lets Numbers identify your input so it can right-align numbers, left-align text, and format items such as dates
and times. Based on its identification of cell content, Numbers displays appropriate formatting options on the Cell tab.

- **Number formats**: The six number choices control how your numeric entries display. Each has a subset of options so you can tweak things to your satisfaction, such as defining a type of currency or the number of digits in a fraction’s denominator.

- **Text**: The text choice has no built-in data-format options.

- **Date & Time**: As explained a little further on, date and time are inextricably intertwined, not only metaphysically, but in the way Numbers stores this information.

- **Duration**: This is time from another perspective. Choose from week, day, hour, minute, second, and, yes, millisecond.

- **Input controls**: These include special items such as those described in Set Up Star Ratings and Build Pop-Up Menus.

- **Custom formats**: These are covered just ahead in Create Custom Data Formats.

To specify a data type, select the cell(s) and choose an option—such as how many decimal places to display—from the Data Format pop-up menu (Figure 52). You can do this before or after the data is entered.

![Data Format Options](image1.png)

**Figure 52**: Data format options, such as those for Currency and Duration, change based on the data type chosen from the Data Format pop-up menu.

**Note**: Even the default Automatic menu choice displays options for some of the data types Numbers automatically identifies.
Use Special Data-Input Options

Numbers has five special cell-formatting options that both limit the scope of the data that can be entered (avoiding some mistakes) and speed up data entry. As a bonus, some of these formats provide at-a-glance information—you don’t have to read numbers and compare them mentally, for example, when you see a string of stars. First up is creating simple but oh-so-handly checkboxes. Then you’ll learn to Set Up Star Ratings for one-click data entry, Define Sliders and Steppers to limit data to a range of allowed numbers, and, finally, Build Pop-Up Menus to control data input.

Create Checkboxes

Checkboxes are easy to add to a table, and incredibly handy when all you need is to indicate whether a certain condition has been met or not: registered, passed exam, met quota, was present. They let you enter information quickly and easily scan a row or column of data.

**Note:** You can try out checkbox setups in the Numbers templates Attendance (under Education) and Recipe (under Personal).

You typically add checkboxes to a column that has a label describing what the checkboxes represent. To set up the checkbox format:

1. Select the cells. They can be blank or filled; Data-Checkbox Swaps, a little ahead, describes what happens if a cell already contains data.

2. Go to the Format inspector’s Cell tab and choose Checkbox from the Data Format pop-up menu.

Numbers puts checkboxes in all the cells. To use the checkbox... well, you know what to do.
**Tip:** Want to check or uncheck a box without your hands leaving the keyboard? With the cell selected, type 1 or T (for True) to check the box, and 0 or F (for False) to uncheck it. (The letters don’t need to be capitals.)

**Touch Bar Tip:** Apple considers the checkbox input so handy that it shows up on the Touch Bar when you tap Format for selected cells (see Touch Bar Data Formatting).

**Manipulate Checkbox Data**

When you check or uncheck a box, Numbers stores the value TRUE in the cell for a checked box, and FALSE for an unchecked one—as you can see if you look at the Smart Cell View at the bottom of the window when a checkbox cell is selected. (I’m not yelling at you—TRUE and FALSE are capitalized in the cell to differentiate them from a plain text entry.) These are very important values, since they’re used as the basis for decisions when you Construct IF Statements.

To remove checkbox formatting, select the cell and choose a different format from the Data Format pop-up menu on the Cell tab. If you choose Text, you see TRUE and FALSE entries in the cells; choose Number and you get a one (for TRUE) and a zero (for FALSE). As explained in What Is Truth?, these are equivalent values: zeros are false, and non-zero numbers are true.

**Data-Checkbox Swaps**

Numbers translates your data into checkboxes according to simple rules about what a checkbox represents: a zero is unchecked, or false, and any non-zero number (including negative values) is checked, or true. Blank cells are unchecked and the words true and false are predictably translated; any other text is unaffected (Figure 65). Just select the cells and apply checkbox formatting from the Cell tab.
Sort Data

This chapter starts with the basics of how Numbers sorts letters, numbers, and blank cells. You’ll see how to quickly Sort with Column Menus, and Sort with the Inspector for more-sophisticated sorts—including a way to Sort Part of a Table. You’ll learn to Master Unsorting and Unsortables (hint: there are ways to sort the latter), and Deal with Special Sorting Issues such as how sorting interacts with headers, footers, merged cells, and hidden rows.

Understand Sorting Order

If you think sorting order is simple and obvious, then you need more variety in your tables. Here’s how Numbers determines sorting order:

- **Numbers**: Numbers are always first. Formatting is ignored, so $2 comes after 1 and before 3, while 3% (since it’s .03) comes before 1.
- **Formula cells**: Cells with formulas in them are sorted according to their results—what’s displayed in the cell.
- **Numeric characters**: These are numerals that aren’t used as numbers, as in a combination like 1-a or numbers in cells formatted to hold text. These numeric characters still sort before alphabetical ones, but they come after actual numbers.
- **Alphabetic characters**: Alphabetic sorting is case-insensitive: capitalization is ignored, so A is the same as a.
- **Dates**: If some dates are identical, they are sorted according to their “hidden” time stamps (see Understand Automatic Data Formats).
- **Punctuation symbols**: Standard punctuation symbols—those in the ASCII set—are sorted according to their codes.
• **Boolean values:** When sorting cells that contain TRUE or FALSE as a result of an IF statement, a checkbox, or direct text entry, Numbers sorts FALSE before TRUE. This might be philosophically upsetting, but it’s because FALSE is considered zero and TRUE is a one (that’s more comforting), so they’re in numerical order.

• **Blank cells:** Blank cells always end up at the bottom whether you do an ascending or a descending sort.

**Note:** When it comes to Option characters—characters you get by pressing Option and another key (with or without Shift)—they are mostly interspersed among the punctuation and the alphabetic characters, with the remainder coming after the alphabet.

## Sort with Column Menus

Simple sorts are a cinch: choose Sort Ascending or Sort Descending from a column menu to sort by that column (**Figure 72**).

**Figure 72:** The column menu’s sort commands.

Note that I said “sort by” that column. The entire table is sorted according to the contents of that column, so rows change position within the table. (This can wreak havoc with some formulas, as described later in **Deal with Special Sorting Issues**.)

You can even *subsort* with column menus: sort data according to one column to group any repeated data there, and then sort the data in the next column so that its data is sorted within each of those groups. However, while “next” might imply a left-to-right order of column sorting, that’s not always the case.
Filter Data

You may not always want to see all the data in a table. Perhaps you want to see only rows with a specific value in column A, or the higher-than-some-threshold values in column B, or checkmarks in column F. You can do this, and more, when you use Quick Filters from a table’s column menus. More-sophisticated options, such as multiple criteria for filters, are described in Filter with the Inspector.

Because this chapter is divided between the use of Filter menus and that of the Organize inspector for filtering, I’ll mention here two items that are common to filtered tables in general:

• You can’t add rows to a filtered table; the Add commands are dimmed.

• Data in hidden rows—those that disappear when a table is filtered—are not included in charts unless you check Hidden Data in the Chart Option section of the Format inspector’s Chart tab (see The Chart Tab.

Note: Here’s an important concept to keep in mind: you don’t filter out a value, you filter for a value. So, you define filters by what you want to see, not by what you want hidden.

Use Quick Filters

When you want a quick look at a subset of the data in your rows, a “quick filter” is your best friend. You can apply it instantly using a column menu, specifying which values you want to remain visible.

You can do quick filtering on an active or selected table using column menus:

• Specify a filter value: Control-click a column label for its menu and choose from the Quick Filter submenu, which lists all the
unique values in the column. **Figure 77** shows that choosing 2 from the column B (Jack) submenu leaves two body rows displayed, since only two rows have a 2. The sums and averages in the table are still calculated from *all* the cells that their formulas reference, no matter how many of those cells are showing.

**Figure 77:** Left: The full table. Center: The Quick Filter submenu for Jack’s column. Right: The filtered table shows only two columns, but the Sum and Average footers are still calculated for all the cell data.

**Tip:** To view a sum, average, or other common statistic for *only* the filtered info, drag across the displayed body cells, and then check the tokens in the **Smart Cell View**.

- **Add a second filter to a column:** Select another item from the same submenu. In the example above, choosing a 3 as the second filter would leave four rows displayed, because there are two 2’s and two 3’s in Jack’s column.

- **Filter a second column:** Choose from that column’s Quick Filter submenu. In our example, filtering for a 6 in column C (Jill) would leave only one row displayed, since it’s the only one that gets through both filters: the value in Jack’s column must be 2 or 3, *and* Jill’s column must contain a 6.

It’s easier to predict how column filters will interact if you imagine one column winnowing the available rows, and the other then winnowing *that* group. The filter order doesn’t matter: you can filter Jack’s column first, and then Jill’s, or start with Jill’s and then filter Jack’s, and the result is the same.
Analyze Data with Categories

In this very hands-on chapter, after you get acquainted with the concept of categories, you’ll Create a Sample Category Table so you’ll have something with which to work. I’ll show you how to Define and View Categories and then Add a Summary Function. Finally, there’s a list of brief but important information in More About Categories.

Numbers’ Answer to Pivot Tables

One of Excel’s premier features is pivot tables, a way of presenting table data from a different point of view, as it were, using different groupings of data—with or without related subtotals, grand totals and other statistics—in a format that lets you collapse and expand the groupings.

Numbers’ take on the pivot-table feature is called Categories, and you can do amazing things with it. But to show you examples of what Categories can do, I have to send you to examples of what pivot tables can do, since they’ve been around much longer.

Pivot tables were probably invented to track sales data, and most examples of the feature use that. But take a look at this one, which shows tracking of voter registration info in an Excel table (skip the how-to part, and check out the results about two-thirds of the way down the page). Also check out this one, in Google Sheets, that does use sales but has two text buttons at the bottom of the table that let you see two pivot-table views of the data.

See the Categories Advantage

Say you’re tracking a school fundraiser and want to analyze the popularity of cookies versus the frozen pie offerings. So, as you get orders, you use a table like the one in Figure 81 to track them.
You’d like to analyze the sales to check the popularity of each item, as well as the overall numbers for the categories (Cookies vs. Pies)—and maybe see if those cute first-graders are outselling their older compatriots.

With Numbers’ Categories capability, it takes only four clicks to go from the table in the figure just above, to the one in Figure 82: a click on a popup menu in the Organize inspector, another on a button there, the third in the table to select a cell, and finally one on a pop-up menu in the table to add subtotals. (Another click collapsed the Pies category, but I’m counting only what it took to make the table.)

![Figure 82: A categories table showing the Pie and Cookies categories and their sales.](image)

Create a Sample Category Table

To experiment with categories, start by making a sample school fundraiser table like the one in Figure 83.
Handle Formulas and Functions

Maybe you won’t ever think of formulas and functions as fun, as I do, but this chapter should at least remove any stress accompanying your dealings with them. It starts with the “quick calculations” available from the toolbar’s Insert menu and from tokens in the Smart Cell View.

After you Learn Formula-Building Basics and how to Work in the Formula Editor to build formulas, I’ll help you Understand Functions and Arguments, and then Explore the Function Browser with you.

Save Time with Quick Calculations

All of Numbers’ calculations are quick—very, very quick—but in the phrase quick calculations, “quick” refers to how quickly you can set up your table to do the most common spreadsheet calculations, skipping the step of opening the formula editor and defining a formula (see Work in the Formula Editor). The quick calculations appear in tokens in the Smart Cell View at the bottom of the window, on the toolbar’s Insert menu, and in the Insert > Formula submenu. As a bonus, you even get to specify which are your most-used calculations.

These are the functions that are initially included in Numbers’ collection of quick calculations:

- **Average**: Averages the numbers.

- **Minimum** and **Maximum**: Finds the smallest and largest values in a range of cells.

- **Count (CountA)**: This is the problem child in the family. The menu lists the Count function, but in fact it’s the CountA function that’s used in the cell, as you’ll see if you check the cell’s formula

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afterward. It’s beyond my imagination why Numbers lists it this way, especially as it’s correctly defined as CountA in the Smart Cell View. CountA reports how many cells in a range contain something—anything. Count, on the other hand, counts cells that contain numbers, expressions that resolve to numbers, or dates, ignoring both blanks and any other kind of data, such as text.

- **Product**: Multiplies the selected cells together using the Product function.

- **Stock Quote**: This isn’t included as a Smart Cell View token, but is included on the toolbar’s Insert menu. When you choose it, you are asked to provide a company name or stock symbol. The current share price appears in the cell, along with a popover that provides lots more information (double-click the share price if the popover isn’t visible). Not surprisingly, you need an internet connection to keep the information current. (The STOCK function is also available for use in the formula editor, just like other functions.) Unlike the other choices on the Insert menu, Stock Quote is disabled if you’ve selected more than one cell.

**Use the Insert Button or Menu**

To use a function from the toolbar’s Insert menu or the Insert > Formula submenu:

1. Select cells in a column or row, or as a block within the table or one that encompasses all the cells of the table.

2. Choose a function from the Insert button’s menu, or from the Insert > Formula submenu.

The formula is automatically placed on the right of a row selection, or at the bottom of a column or a block selection, adding cells to the table if necessary to accommodate it.

Numbers has done all the work for you, but in the end, it has simply constructed a formula with the function you chose and the cells you selected, as you can see if you check the cell (Figure 89).
Master IF Statements and Logical Operators

Back in the *original* Star Trek days, my grandfather made fun of “Dr. Spock’s” funny ears, conflating the Enterprise science officer with the baby-care expert who had come to fame a decade before. I loved Mr. Spock for his adherence to logic above all else (and his cocked-eyebrow reaction to Captain Kirk’s lack of same). It’s probably not coincidental that when I first encountered computer programming, I was most enamored of its use of logical functions, and that affection carried over to their use in spreadsheets.

But, enough history. This chapter first delves into the concept of truth, as interpreted by a spreadsheet formula, with a quick side trip to Review Comparison Operators; after that, we’ll Construct IF Statements. You’ll Learn About Logical Operators (AND, OR, and NOT) and see how they expand the usefulness of IF statements, and then you’ll Put It All Together to construct a formula. Finally, you’ll see how to Construct Nested IF Statements, an incredibly convenient and flexible calculation tool.

**Note:** Between the time I wrote this intro for the first edition and then reviewed its edits, Leonard Nimoy—“Mr. Spock”—died. LLAP 🖤.

What Is Truth?

*What is truth?* Surely, a question for the ages. Except in a spreadsheet, where the definitions for *true* and *false* are straightforward:

- **Numbers and expressions that evaluate to numbers:** A zero is false, and all other numbers are true. So, 42 is true; so are $3+5$, and $-15$, and a reference to cell B7 unless it holds a zero.
• **Numeric comparisons:** Comparisons are intrinsically true or false: $4<3$ and $5=7$ are false, while $12>10$ and $4\times3>10$ are true.

• **Text:** While text by itself is “false” (since it’s not a non-zero number), it can be used in the truth test of an IF statement. So, if the name Bartleby is in B2, the comparison in the statement `IF B2="Bartleby"` is considered true.

• **Blank cells:** References to blank cells return a false result.

The importance of “truth” in a spreadsheet is not an issue of accuracy, but one of what is entered in a cell based on some condition that you can test—the equivalent of *If HighestSalesFigure is greater than $5000, then put “High Sales Award” in this cell.*

**Note:** The word TRUE or FALSE alone in a cell is considered true or false in an IF test; they are so special that if you type either in lowercase, it’s automatically capitalized. When you Create Checkboxes the actual cell content is TRUE if checked, and FALSE if not.

---

**Review Comparison Operators**

While I shouldn’t assume anything at all about you, I wrote $4>3$ in the previous topic (just above), assuming that you know it means “4 is greater than 3,” and that $4<3$ means “4 is less than 3.” Just as plus, minus, and equals signs are considered mathematical operators, the greater than and less than symbols are *comparison* operators, and they get heavy-duty use in IF statements.

The other comparison operators are $\geq$ (greater than or equal to), $\leq$ (less than or equal to), and $\neq$ (does not equal). These characters are available from the keyboard using the Option key: Option-period, Option-comma, and Option-equals). However, you can simply type the two-character version of an operator ($\geq$, $\leq$, or $\neq$) in the formula editor, and Numbers replaces it with the single-character version.
Work with Text Functions

Say your friend/brother/boss gives you get a spreadsheet of names and addresses and says: “I need just a list of names (last name followed by a comma and then the first initial); the data came in a little weird and the state abbreviations need to be capitalized; the city, state, and zip code columns need to be combined with a comma and space inserted after the city, and a space between the state and zip code, okay? And, oh, can you automatically generate an email address that each person will be assigned—it’s just the last name, the first two letters of the first name, the ‘at’ symbol...”.

Yes, you can do all these things—and easily, since Numbers lets you manipulate text in many ways. In this chapter, after you get acquainted with text terminology, you’ll Learn Basic String Manipulations—combining and splitting strings of alphanumeric characters so you can do such things as extract the last name from a cell that holds a full name. After that, I’ll show you how to Master Other Common Text Tasks, such as changing uppercase letters to lowercase, or vice versa, and stripping extraneous spaces out of sloppy data.

Well before you reach the end of this chapter, you’ll understand this text-manipulation formula, and why you’d want to use it:

```
RIGHT(A2, LEN(A2) - FIND(" ",A2,1)) & ", " & LEFT(A2, FIND(" ",A2,1)-1)
```

Really. Promise.

Know Your Text Terminology

Here’s a turbo lesson on the terms and concepts we use when manipulating text in a spreadsheet:

• A string is any series of characters—letters, numerals, punctuation, and/or symbols. It can be only letters, but doesn’t have to be, and it’s often referred to as a “text string.”
In formulas, strings appear in quotes: “John” or “Final:” or “.edu”.

When strings are being compared, everything counts: spaces, punctuation, and letter case. None of these strings matches any of the others: A well-done steak; a well-done steak; A well done steak.

An empty string is a pair of quotes with nothing inside: "". It’s often used in a formula to delete unwanted characters (by replacing a character with an empty string—nothing).

You can’t “add” text strings together (how much is “hello” + “there”?). But you can concatenate them—join them together—with an ampersand. So, while 2+3 equals 5, the concatenation "hello"&"there" results in hellothere. You can type a space on either side of the ampersand to make the formula easier to read ("hello" & "there"), but it’s not necessary: spaces outside quotes aren’t used in a calculation. When you need a space between words, put it in quotation marks in the formula: "hello"&" "&"there" results in hello there.

If you’re paying close attention, you might be thinking that you could just use "hello there" with the embedded space, and you’d be right. But you’ll be using this technique when referencing cells containing text: B2" "&C2.

Learn Basic String Manipulations

Before I provide specific examples, here’s some general guidance for creating your own formulas to handle text strings.

When you need to manipulate text to create a specific outcome, think about the details you need. For instance, for a last name followed by an initial, you need:

last name + a comma + a space + first letter of first name

With a spreadsheet that includes full names, it’s easy to see what the spreadsheet provides (last name and first name), what you have to add
Create Charts

A chart or graph is not only a good way, but often the only way, to reasonably interpret a pile of data. Numbers provides enough chart choices to both represent almost any data you’re wrangling and potentially confuse you as to which type to use. And you could practically suffocate in its variety of formatting options, unless you stick with straight-vanilla presentations—and who wants that?

We begin at the beginning—chart terminology—and then cover how to Choose the Right Chart. Next, you’ll see how to Create a Chart and Edit Chart Data, and we then move on to Numbers’ specialities with Design 3D Charts and Make Interactive Charts.

Learn Chart Parts and Terminology

Working with charts requires a somewhat specialized vocabulary, as you can see in Figure 113, which shows a bar chart, one of the most common chart types. Most of the labelled items are also used in other kinds of charts (described just ahead in Choose the Right Chart).

![Figure 113: Elements of a chart.](image)

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Here’s a brief description of the labels in the figure, along with some related terms:

- **Chart title**: This starts out hidden; turn it on by clicking the Title checkbox in the Chart Options section of the Format inspector’s Chart tab.

- **Axes**: The vertical axis of a chart is the Y axis (fifth-grade mnemonic: \textit{Y goes to the sky}); when there are two, they’re referred to as Y1 and Y2. The horizontal axis is the X axis. A value axis is one that has numeric values; a category axis has text that describes groups of data.

  
  \textbf{Note}: If you visualize the sample chart above as a bar chart (with horizontal bars instead of vertical columns), you’ll realize that the value axis is not always the Y axis, nor are categories always on the X axis.

- **Data series**: This is a set of values that make a line, or bars of the same color, in a chart. In a scatter chart, they’re the values that define either the x-coordinate or y-coordinate data.

- **Scale**: The scale defines the components of a value axis: its lowest and highest values, and the intervals between.

- **Value labels**: These are optional elements that identify the exact value for each data point. The labels can be within or outside the bar, column, or pie wedge, and be vertical, horizontal, or diagonal.

- **Legend**: An optional, but almost always necessary, element that identifies the data series (or the pie slices) in the chart.

- **Category labels**: These typically identify the X axis items, which are usually categories rather than numbers; they often identify groups of data, as they do in Figure 113, above.

- **Background and border**: The background is the area behind the lines or bars (or pie), not the entire chart with its axes and labels; it includes a donut chart’s hole. The border is simply the edge of the category axis—the bottom edge in the figure above.
Format Charts

When it comes to charts, the Format inspector provides formatting options for both the overall chart (background color and legend text, for instance) and its separate elements (such as bar/line color and data labels). Which tabs are available depends on what you’ve selected: a whole chart (and what kind) or chart elements (and which ones). The options within each tab also vary with your selection. There’s an overabundance of formatting choices for charts, which can’t all be covered here; for the most part, their use is obvious (adding and formatting labels, choosing colors, and so on). This chapter covers the more important, and the less obvious, features in these tabs.

After you learn how to select individual chart elements, we explore the formatting tabs (The Chart Tab, The Axis Tab, The Series Tab, The Style Tab, and The Pie and Donut Chart Tabs), where you can set all the basic formatting for a chart as well as do such things as reposition value labels, change the style of the lines in line charts, and explode a pie or donut chart or reorder their pieces. I also show you how you can Manipulate Images for Fills to put pictures in bars, columns, and pie wedges, and Tweak Text Elements so that your titles and labels are as clear as your data presentation.

Select Chart Elements

While some formats affect the entire chart, others can be applied to elements separately. So, you can highlight the columns that represent the current year by outlining them with a dotted line, or put values inside most of the columns of a chart but call out one series by having the value outside the graphic.

To format any individual element, first select the chart by clicking any part of it, and then click the element. To select a series, click one of the lines (or a single bar or column), which selects it and others of its
color. You can also select a series after you’ve clicked a chart’s Edit Chart Data button by clicking the row or column in the source table.

Once a series is selected, add another to the selection with a ⌘-click, or select all of them with Edit > Select All (⌘-A) (Figure 135).

![Figure 135: Left: Clicking any column selects the entire series. Right: After formatting the selected series.](image)

Selecting text elements is covered in Tweak Text Elements.

**Tip:** Resize a chart by selecting it and then dragging a selection handle. Resize it more in one direction than the other to change its look—making columns taller and thinner or short and fatter, for instance. Resizing has no effect on a chart’s text elements other than moving them so they remain associated with the items they identify.

**Touch Bar Tip:** The Touch Bar provides many shortcuts for chart formatting, with choices dependent upon what’s selected. When the entire chart is selected, for instance, you get Show/Hide Category Labels and Series Values, and the option to enlarge or shrink all the text. Selecting a text element provides more granular text-formatting choices (see Touch Bar Text and Paragraph Formatting).

There’s an overabundance of formatting choices for charts, which can’t all be covered here. For the most part, their use is obvious: adding and formatting labels, choosing colors, and so on. This section covers the more important, and the less obvious, features in these tabs.
Add Comments

You can attach a comment to almost anything in Numbers: a table cell (although not the table itself), a chart, a text box, specific text inside a container, objects such as shapes and images, or the sheet itself. You can make notes for yourself, or to colleagues sharing the file; comments are time- and date-stamped, and color coded to each user of a document.

This chapter starts with the basics of setting options related to comments; after that, I describe how to Handle Comments and Replies.

Set Comment Options

You can choose a color for your comments, which is applied to the notes themselves and also to their markers on objects. If you’re writing comments for anyone besides yourself, you should also set your author name so other users know who made what comment or reply. These settings are not all in the same place:

- **Comment color**: Choose a color from View > Comments > Author Color (you don’t have to select a comment note first). The color is used for all comments by a specific author in a document, across all its tabs. For notes attached to objects or table cells, the color is discreetly applied to the author’s name and the note’s text buttons (Reply, Delete, and so on); freestanding notes on the sheet use the color for the “paper,” with a darker shade for text buttons (Figure 164).

Figure 164: A note for an object and for a sheet.
• **Author name:** Go to Numbers > Preferences > General and enter an author name. Changes to this setting, and to text size, are retroactive not only for the current document, but for all open documents and any document you open afterwards. (When a document is shared through iCloud, the “author name” is the collaborator’s iCloud name.)

• **Text size:** Choose from the pop-up menu at the bottom of the preference pane.

---

**Solo vs. Swapped vs. Shared**

There are three basic scenarios in which you’d be using comments:

✦ **In a document for which you’re the only user:** Comments are handy even when you’re the sole user of document: make reminder notes about missing or temporary data, for instance, or use a comment and multiple replies to track the history of changes to data or a formula.

✦ **In a shared document:** You might be simply emailing a document back and forth for colleagues to see, edit, or specifically comment on. The author of each comment and reply is identified in the comment. Note, however, there’s nothing that prevents any user from deleting notes or even editing others’ comments and replies, because there’s nothing that identifies a swapped document as having originated somewhere other than the current Mac, or having been created by anyone other than the current user.

✦ **In a collaborative document in iCloud:** When you share a document through collaboration in iCloud (read Share and Collaborate), the person who posted it is the owner, and has privileges other users do not.

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**Handle Comments and Replies**

It’s not always obvious which elements can hold comments. You can attach a comment to:

• **A table cell:** You can’t add a comment to the table as a whole, but you can put one in any cell, and add as many comments as there are
Create Voice Recordings

You can add one or more voice memos to your sheet, for yourself or for someone who’s sharing the document. After you make a recording, you can Work in the Audio Tab, where there are some special options, and learn how to trim a recording and to add or replace its ending in Edit a Recording.

Create a Recording

1. Choose Insert > Record Audio and click the Start button in the Record Audio window that appears. (You can move this window—which I’ll refer to as the “recording window”) within the confines of the sheet.)

2. Speak your piece, and then click the Stop button.

   You can also use the Stop button to simply pause; it changes to a record button so you can continue recording.

3. Add the recording to your sheet by clicking the Insert button (Figure 168).

   If you want to review the recording first, click the Preview button. The audio plays, and an Edit button appears in the corner so you can alter it.

   Figure 168: The recording window: Ready to record; during recording; and after clicking the Stop button.

A recording is represented on the sheet by an icon that changes based on the state of the recording. When it’s dormant, the standard sound icon is displayed. When you’re playing the recording, the icon toggles...
between pause and play buttons; it returns to the dormant stage when you click another object or the sheet itself (Figure 169).

![Pause, Play, and Volume Icons](image)

**Figure 169:** The three states of a recording icon: dormant, playing (providing a Pause button), and paused (providing a Play button). The blue “halo” indicates the recording is selected.

In the figure above, which shows these states, the blue “halo” around an icon indicates it’s selected on the sheet, and the white perimeter arc represents how much of the audio has been played. (Oddly, what *doesn’t* change is the size of the icon when you *Zoom In and Out.*) The red title/instructions beneath the icon in the figure is simply a text box (see Put Text in Text Boxes and Shapes), added to instruct an uninformed user with whom the spreadsheet might be shared.

**Tip:** If you lock an audio icon to keep it from being moved, it’s still playable. (Locking and unlocking objects is covered in Work in the Arrange Tab.)

---

**Work in the Audio Tab**

The Format Inspector’s Audio tab, available when a recording is selected, provides some playback controls that are not otherwise available, and yet another route to editing your recording (covered next).

Go to the Audio tab to:

- **Fast forward or backward:** Press and hold either button to move to a spot in the recording where you want to start editing.
Work with Shapes and Images

In this chapter, I show you how to Add Shapes to a Sheet and alter the default color offered in the toolbar’s Shape menu in The Color of Shapes. You’ll learn Basic Shape Editing, Advanced Shape Editing, and how to avoid recreating special shapes when you Save a Custom Shape or Use Shape Styles. Next, it’s All About Arrows, where you’ll learn about options for creating arrows (and other line endpoints). Finally, in Use Image Galleries, you’ll see how to store, view, or search a series of images that can be viewed by flipping through them or by searching for the key words that you’ve entered.

Note: Other chapters cover features that also apply to shapes: Manipulate Objects, Conquer Color Controls, and most of Tackle Text (especially Put Text in Text Boxes and Shapes).

“Drawing” Shapes

You can use shapes—not just what you think of as geometric or freeform shapes, but also lines and arrows—to enhance a document and make it more cluttered... I mean, understandable. And let that be a lesson: it’s easy to slip from understandability to clutter, so don’t get carried away. Toward that end, I shall avoid getting carried away in my coverage, which is difficult because working with shapes can be so creatively satisfying—and even more fun now, since Numbers added a plethora of new pre-made shapes. (I wrote that previous sentence in a prior update to this book; the latest Numbers update includes even more shapes, but how many—and why? There are about 1000 shapes now, but I have no answer for the second question.)
And why is “drawing” in quotation marks in this section title? Because 99% of the time instead of drawing you’ll be hammering a pre-made shape into... shape.

---

**Add Shapes to a Sheet**

Numbers includes so many shapes that it has a toolbar Shape popover that includes a scrolling category list and even a *search field*!

But before you head there, if you’re looking for one of the dozen most frequently used shapes, head to the Insert menu’s Shape submenu, which lists what it believes to be those dozen (**Figure 172**).

![Figure 172: The Insert > Shape submenu.](image)

Click the Shape button on the toolbar to access the popover. The color of the shapes in the popover, as with other toolbar object choices, depends on the styles in the current document. To peruse the shapes, scroll down in the right pane or click a category in the scrolling pane at the left (**Figure 173**); click the shape you want added to the sheet.
Tackle Text

A spreadsheet’s main concern is numbers, but it also needs text to identify what the numbers represent. I don’t cover basic text formatting here, as it’s the same as in other Mac apps. But it is important to know how to handle text in and outside of tables, and the latter starts with the “text container” concept. Then we Tour the Text Tab, learn how to Put Text in Text Boxes and Shapes, and Create Bullet and Ordered Lists. After that, I show you how to Type in Shorthand with Text Substitution and Use Paragraph and Character Styles. Finally, you’ll learn how to Search for Text and even Search for and Replace Fonts throughout your document (the latter may not be as handy as it sounds).

What’s a Text Container?

In Numbers, text is always inside something—a container. Sometimes that’s obvious (a text box or a shape), but elements of an object can also be text containers: a table’s name and each of its cells, for instance, or a chart’s name, legend, and labels.

Here’s what you should know about text containers:

- If there’s text on the clipboard and you use the Paste command with no container selected, Numbers obligingly creates a text box and puts the pasted text in it.

- To paste text into a container, you must first select the container, and then click inside it to set the blinking insertion point. (Otherwise, Numbers creates a new text box for the text.)

- Format all the text in a container by selecting the container and applying the format. To format some of the text, first select it and then apply the formatting.
Tip: If the text in a container is active but you want the container itself selected so you can format it or move it with the arrow keys, press ⌘-Return. (This is a mite quicker than the alternative: click outside the container to inactivate the text, and then click the container to select it.)

Tour the Text Tab

Here’s a Cook’s tour of the Format inspector’s Text tab, because even ebooks have page-count limits, and we have more important things than text formats to cover. The tab, with its Style and Layout buttons, is available when you select text or a text container:

- **Style**: Click the Style button to see general text-formatting choices and options for Create Bullet and Ordered Lists.

- **Layout**: A click on the Layout button provides these options:
  - **Columns**: Work here to create text columns within a shape. Define the number of columns (type a number or use the arrows next to the field), their width, and the width of the gutter—the space between the columns. To redefine a column’s width, double-click its measurement in the Column column (!) and type the new size (Figure 183); if you’ve checked Equal Column Width, all the columns change to match. Change the gutter size similarly; multiple gutters can have differing widths.

![Figure 183: Edit column and gutter sizes on the Layout pane.](image-url)
Manipulate Objects

Tables, with their strict row-and-column structure, can keep even the most disorganized user in check. But as you work on a sheet you’re not confined to a grid as you add tables, some charts, a few text boxes and maybe even images, movies, and recordings.

Fortunately, Numbers provides tools that can keep sheet elements in line (literally). In this chapter, after you attend to the basics of setting ruler and guide preferences and reviewing how to Select and Move Objects, you learn how to align, group, and resize selected objects manually when you Work on the Sheet, and see how to take a more by-the-numbers approach (no pun intended) when you Work in the Arrange Tab.

Set Ruler and Guide Preferences

Before trying to organize things on a sheet, set your preferences for rulers and guides, since you need them for precisely sizing and placing objects. Go to Numbers > Preferences > Rulers and then:

- Choose a unit of measure for the rulers.
- Check “Show size and position when moving objects” to see a readout near the pointer whenever you move or resize something.
- Set a color for guides. This affects both ruler and alignment guides.
- Activate all four “Show guides” options, as they are not as intrusive as you might assume, and they’re invaluable for neat sheets.
- If your Mac has a Force Touch trackpad, experiment with the haptic feedback option, and then decide if you want to use it. When the setting is checked, you get feedback as you drag an object around on the sheet: you can feel when it snaps into alignment with another object. However, since an object can be aligned at its top, bottom, sides, and vertical and horizontal centers with those same align-
Select and Move Objects

Methods for selecting and moving objects on a sheet are common to most apps (and the Finder), so here’s a quick review:

• **Select an object:** Click to select something; Shift-click or ⌘-click to add an item to, or remove it from, a selection. Drag around multiple objects to select them—they don’t have to be completely inside the dragged area: you can just drag the cursor so that it touches each of the items.

  **Tip:** Once an object is selected on a sheet, pressing Tab selects the next object, and Shift-Tab the previous one. The selection order is top-down; if two objects’ uppermost parts are at the same spot, their order is left-to-right.

• **Move an object:** Drag it, or use the arrow keys to nudge a selected object, adding Shift to an arrow key to move the object by larger increments. Add Shift to a drag (press after you’ve started dragging) to constrain the motion vertically or horizontally. For exact positioning, use the coordinate controls in the Position section of the Format Inspector’s Arrange tab.

• **Copy an object:** Press Option when you drag an object to pull out a copy. To Option-drag an active table, you must grab it by its name or its table handle; anywhere else selects the cells you’ve touched. An inactive table can be Option-dragged by its name; if it has no name, you must activate it before Option-dragging.
Conquer Color Controls

What a long way we’ve come from the black-and-white world of the early Mac and the first spreadsheet program it had from Microsoft... *Multiplan!* (Didn’t see that coming, did you?)

In fact, we’ve come so far that color options get their own short chapter, since they are myriad, ubiquitous (for tables, cells, charts, lines, shapes, and even text), and not always intuitive.

After a tour of the *color well* approach for color choice, I show you how to Design Gradient Fills and Customize Color Palettes so you don’t have to recreate a nonstandard color when you want to use it again.

Meet the Color Well

A *color well* provides color choices; in a stretched-to-the-limit metaphor, you dip into the well for a color. The well displays the color of the currently selected item and/or any special characteristics, such as a gradient or an opacity level, and also indicates if no color is applied (*Figure 202*). The “duplex” version includes a Colors button that opens the Colors window for roll-your-own hues.

*Figure 202*: The many faces of a color well. Top: Solid, a color with a Colors button, no color applied, and multiple colors in a selection. Bottom: a gradient fill, a base color and its current opacity level, and an image fill.

A click on a color well opens a popover that shows the colors in the document’s palette (which comes from the document’s template). The popover changes based on what’s selected on the sheet (*Figure 203*).
**Figure 203:** Typical color well popovers. Left to right: A basic palette; an extended popover with multiple palettes for fills; a six-color groupings for charts (note the dots on the bottom and side arrows that indicate another page of choices).

Clicking the Colors button on a color well opens the Colors window *(Figure 204)*—also called the “Color Picker”—a standard Mac interface element for picking a color; it provides five approaches to choosing colors through the tabs along its top.

**Figure 204:** The Colors window. The sample in the lower-left is the current color; the small sample blocks are user-defined.

**Tip:** The Crayons tab has 11 shades of gray for quick, easy-to-replicate pickings; they’re convenient if you can’t print in color.
Import, Export, and Share Files

There’s lots of talk, much of it snide, regarding the Apple “ecosystem” and its “walled garden” of hardware and software that work together—and alone, not always playing well with others. If there’s any place Apple and Mac users can’t ignore the outside world, it’s the spreadsheet arena, where Excel has worn the laurels for decades.

This chapter explains how you can exchange files with Excel and Import and Export Delimited Files (text files that use punctuation and paragraph returns to indicate row-and-column data), including those that use multiple or nonstandard delimiters. You’ll learn how to Use Advanced Import Settings and, because sometimes you’ll need to work in the other direction, you’ll also learn how to Export as a CSV File. Finally, if you want to Share and Collaborate “live” with other users, you can get started with the basics here.

Exchange Files with Excel

Numbers’ and Excel’s interfaces differ so fundamentally that it’s amazing they can talk to each other at all. A Numbers sheet is a blank canvas that can contain tables, charts, graphics, and standalone text, and a Numbers document can contain multiple sheets. An Excel worksheet is a vast, window-filling grid; a document can have multiple worksheets, and is then referred to as a workbook; its charts, and any images you add, float in movable, resizable window-ish frames.

**Note:** Because the concept of “sheet” differs in Numbers and Excel, I’m going to use Excel’s alternative term, *worksheet*, when referring to the Excel environment to avoid confusion, as I just did in above.

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Import Excel Documents

The good news is that you can open Excel documents in Numbers, and even charts can survive the procedure. The not-as-good news is that not everything survives, since Excel offers functions and options that Numbers does not. (This Apple page offers a very extensive list of supported, partially supported, and unsupported Excel features.) And now back to the good news: many things import flawlessly or with only minor problems, including cell and chart formatting and table-status items such as hidden columns—and even graphic elements.

Export Excel Documents

Exporting a Numbers document in Excel format keeps improving; I’m amazed at how much of the Numbers document survives intact, especially when it comes to various types of charts.

Here’s what happens when you open an exported Numbers document in Excel:

- Each sheet in the Numbers document becomes a worksheet in Excel, except when components from the Numbers sheet must be split across multiple sheets.

- Although an Excel worksheet can look like a blank canvas, it’s not: it’s still a giant table grid—just one with its gridlines turned off. An exported Numbers sheet with multiple tables can look exactly the same when you see it in an Excel worksheet, but it’s not. What happens is that the data (along with table and cell formatting) of each Numbers table is placed on the Excel grid, in positions that correspond to their places on the Numbers sheet, and the worksheet’s grid is turned off. Very clever—and very useful.

- A Numbers sheet with tables and charts survives intact: the table data goes into the Excel grid and the charts float above the grid the same way Excel’s native charts do. (Previously, multiple tables wound up on separate worksheets and their charts on a worksheet of their own.)
Print Spreadsheets

In Numbers, Apple chose to completely ignore its own interface for printing documents (the venerable Print dialog), and the result is a limited, non-intuitive, annoying setup. I shall henceforth (except for the spoiler alert below) refrain from complaining about what’s not available when it comes to printing, and show you how to use, and make the most of, the available options, with some special attention regarding how to Hone Headers and Footers.

Spoiler alert: There’s no way to specify page breaks for tables or other elements in your document. They happen where they happen.

Print Your Sheets

The simplicity of printing from Numbers is the very thing that constrains you from really controlling your output. Here’s how to print a sheet (you must set options separately for each sheet in the document):

1. **Preview the print version:** Choose File > Print.

   Numbers switches into a preview mode, where each sheet in your document gets a tab at the top of the window’s content area. The active tab is the sheet you were working on; its name is white, and its pages are shown as (very large) thumbnails.

   The Print Setup options appear in the sidebar, which is scrollable if you’re working on a smaller screen (Figure 217).

   **Note:** To cancel preview mode at any time, click the Done button at the bottom of the Print Setup sidebar or press Esc.
2. **Set print options**: Set the margins, paper size, orientation, and other basics on the sidebar’s Print Setup tab; these options are wonderfully self explanatory. (For help squeezing things on a page, read the sidebar Make It Fit, just ahead.)

3. **Create headers and footers**: Hover over a page thumbnail to see its header and footer fields; click a field to add text to it. You can set up a header and/or footer with automatic text such as a page number or date; for the most part, you can add such content to headers and footers from the Insert menu—the Page Number, Page Count, and Date & Time commands insert smart-field information and are covered ahead, in *Hone Headers and Footers*.

   When you are editing a header or footer field, a Text tab appears in the sidebar so you can format the text.

4. **Specify sheet printing**: Click either This Sheet or All Sheets at the bottom of the sidebar to specify whether you want to print the current sheet, or all sheets in the document. (To print some, but not all, sheets, you must print each one separately.)

5. **Click Print**: Click the Print button at the bottom of the sidebar, or choose File > Print again.
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About the Author

Sharon Zardetto is a well-known and widely read author who started her computer-writing career just before the Mac arrived on the scene, at which point she realized where she belonged.

Her many hundreds of magazine credits span Macworld magazine’s first and last years of print publication, and include many other magazines along the way. She has written more than 30 books, starting with one about programming a computer with 2K of internal memory (that’s not a typo: 2K, with a 16K RAM pack add-on later), a membrane keyboard, a black-and-white television as a monitor and cassette-tape storage. This book was written on a laptop Mac with 16GB of memory and a terabyte of storage: that’s 8 million times the memory and more than a gazillion times the storage capacity.

Acknowledgments

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