Chapter 52
Charting tricks

Questions answered in this chapter:

- How do I create combination charts?

- How do I create a secondary axis?

- How can I handle missing data?

- How can I handle the appearance of hidden data?

- How can I use pictures to add bling to my column graphs?

- I charted annual sales data in a column graph, but the years do not show up as column labels. What did I do wrong?

- How can I include data labels and data tables in my charts?

- How can I use Excel 2016 to place data labels on a chart based on the contents of cells?

- How can I track sales-force performance over time?

- How can I create a band chart to check whether inventory is within acceptable levels?

- How can I store a chart as a template?

- How can I use a thermometer chart to portray progress against a target?

- How can I create dynamic chart labels?

- How can I use check boxes to control which series are charted?

- How can I use a list box to choose the series to be charted?

- How do I create a Gantt chart?

- How do I create a chart based on sorted data?

- How can I create a histogram that automatically updates when I include new data?

- How can I add conditional colors to a chart?

- How can I use waterfall charts to track progress toward a sales target or to break down the components of a sales price?

- How can I use the GETPIVOT data function and Excel's table feature to create dynamic

dashboards?

- How can I insert a vertical line in a chart to separate pre- and post-merger performance?

- How can I use a radar chart to portray how basketball team members differ in strength, speed, and jumping ability?

- I know I can use a scatter chart to display how two variables change. How can I use a bubble chart to summarize the variation of three variables?

- How do I create waterfall charts with Excel 2016?

- How do I use an Excel 2016 treemap and sunburst chart to summarize hierarchical data?

An old Chinese proverb says a picture is worth a thousand words. Excel can create many amazing charts, and in this chapter I will show you many examples of charting tips and tricks. Be aware that charting in Excel has changed a lot (for the better!) from previous versions of Excel.

Answers to this chapter's questions

How do I create combination charts?

The file Combinationstemp.xlsx contains actual and target sales for January through July. You would like to create a chart that shows each month's actual and target sales. First, I select the range F5:H12 and, from the Insert tab, I select Insert Column Or Bar Chart. I choose the first chart in the 2D Column Chart options (the clustered column chart) to create the chart shown in Figure 52-1.
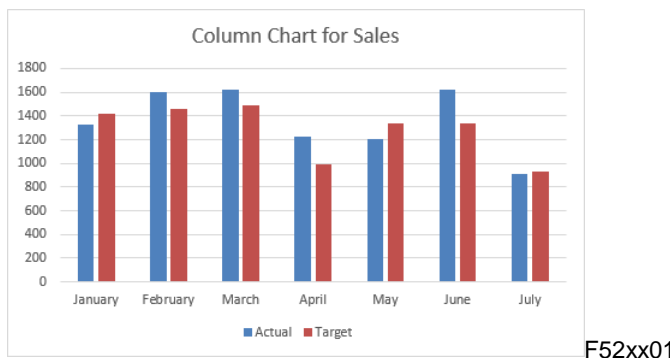

F52xx01

FIGURE 52-1 A column chart for the actual sales and sales target.

F52xx01: This figure shows a column chart summarizing the actual and target sales.

Using two columns makes it difficult to see the contrast between the actual and target sales, so I prefer a combination chart in which one series is charted as a line and the other as a column. To create this chart, right-click on either series and select Change Chart Type. After clicking Combo in

the left pane to see the options, I chose the first Clustered Column - Line choice, shown in Figure 52-2, and I obtained the combination chart shown in Figure 52-3.
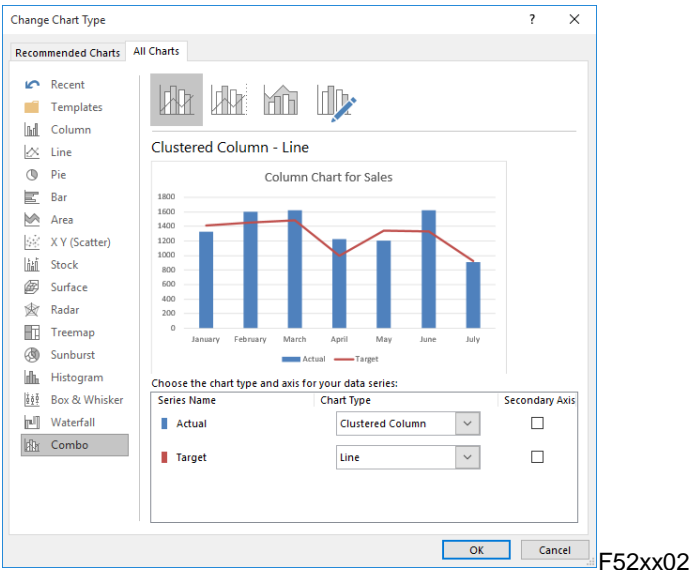

F52xx02

FIGURE 52-2 Selecting the combo-chart type.

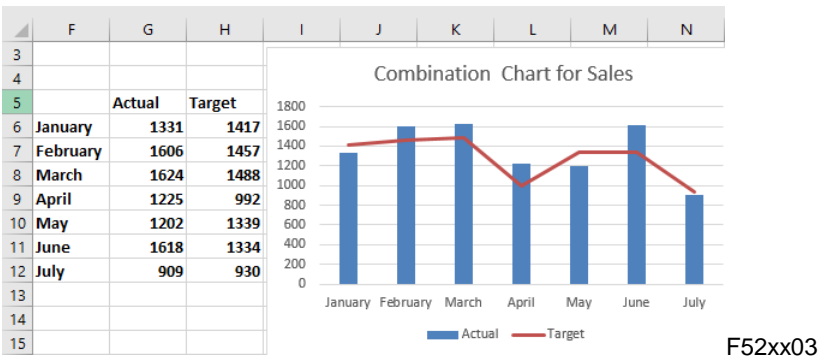F52xx02: This figure shows the settings needed to create the combo-chart type.

F52xx03

FIGURE 52-3 A combination chart.

F52xx03: This figure shows a combination column-line chart that summarizes each month's actual and target sales.

How do I create a secondary axis?

When charting two quantities of differing magnitude, a secondary axis is often needed to make sense of the chart. To illustrate the idea, Figure 52-6 (see the file Secondaryaxis.xlsx) shows the monthly revenues and units sold. If I show this data on a single y-axis, monthly revenues will be hardly visible.

To remedy this problem, I begin by selecting the range (D7:F16) that I want to chart. Then, from the Insert tab, I select the Combo chart icon (shown in Figure 52-4) and then select Create Custom Combo Chart. I filled in the Insert Chart dialog box as shown in Figure 52-5: in addition to the default settings, select the Secondary Axis check box for the Revenue series, and then click OK.

F52xx04

FIGURE 52-4 The combo chart icon.

F52xx04: This figure shows the combo chart icon.
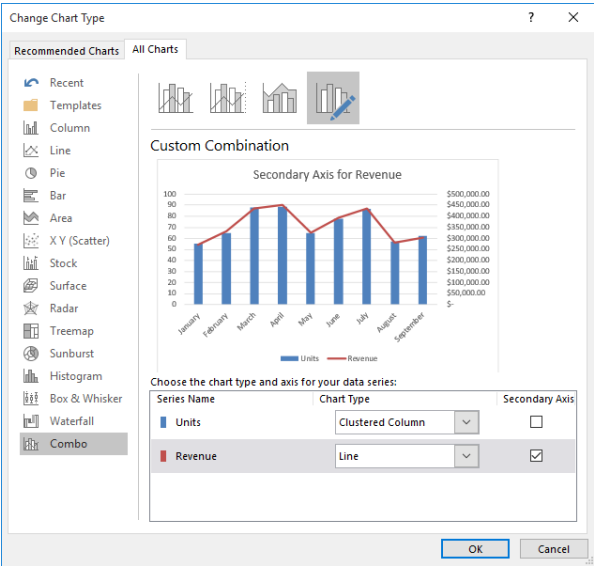
F52xx05

FIGURE 52-5 Creating a combo chart with a secondary axis.

F52xx05: This figure shows the settings needed to create a secondary axis for Revenue.

The resulting chart (see Figure 52-6) has revenue summarized on a secondary axis with a line chart and clearly shows that monthly revenues and units sold change in a virtual lockstep fashion.
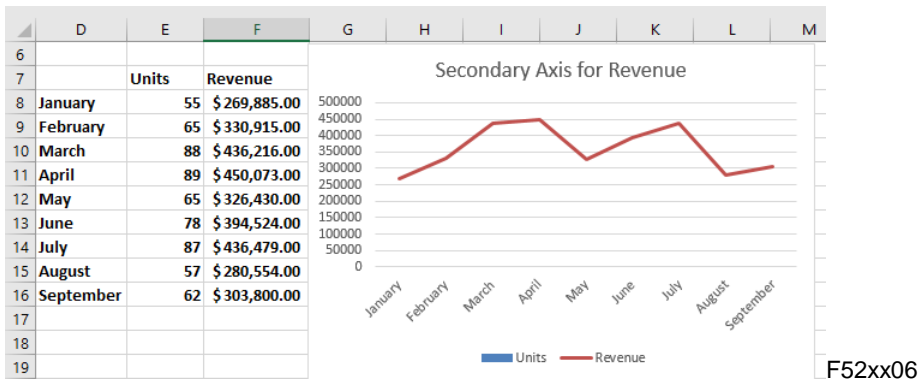
	D	E	F	G	H	I	J	K	L	M
6										
7		Units	Revenue							
8	January	55	$269,885.00							
9	February	65	$330,915.00							
10	March	88	$436,216.00							
11	April	89	$450,073.00							
12	May	65	$326,430.00							
13	June	78	$394,524.00							
14	July	87	$436,479.00							
15	August	57	$280,554.00							
16	September	62	$303,800.00							
17										
18										
19										

F52xx06

FIGURE 52-6 The secondary axis is used to summarize revenue.

F52xx06: This figure shows a secondary axis used to summarize revenue.

How can I handle missing data?

Often, some rows of a spreadsheet have missing data. Excel gives you the following three ways to chart missing data:

- Show the data as zeroes.

- Show the data as blank.

- Replace a missing data point by a line joining adjacent data points.

   To illustrate how you can handle missing data, look at the file Misssingdata.xlsx. This file contains hourly temperatures, but several values are missing. After plotting the data as a line chart, I right-click the data and choose Select Data. In the Select Data Source dialog box, click Hidden And Empty Cells in the lower right. This brings up the Hidden And Empty Cell Settings dialog box shown in Figure 52-7.
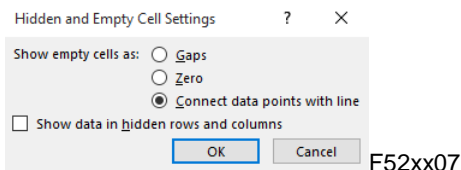

F52xx07

FIGURE 52-7 The Hidden And Empty Cell Settings dialog box.

F52xx07: This figure shows the settings needed to chart missing data with lines joining the available data.

   After selecting the Connect Data Points With Line option, I obtain the graph shown in Figure 52-8. Note that I chose the line graph choice with dots and lines so that I identify the missing data: the missing data points have no dots.
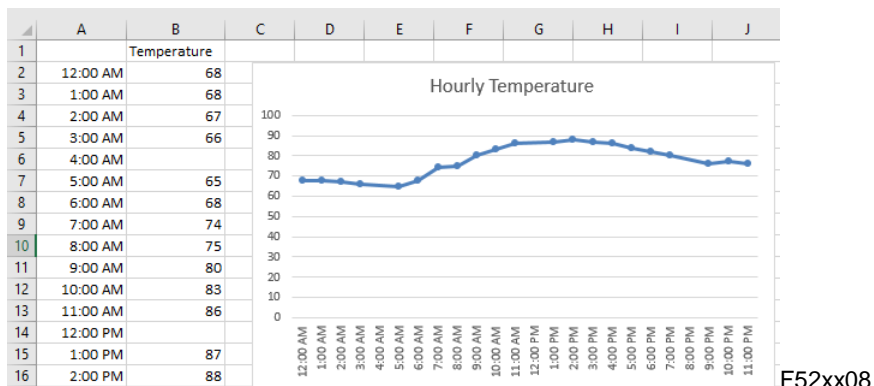
	A	B	C	D	E	F	G	H	I	J
1		Temperature								
2	12:00 AM	68								
3	1:00 AM	68								
4	2:00 AM	67								
5	3:00 AM	66								
6	4:00 AM									
7	5:00 AM	65								
8	6:00 AM	68								
9	7:00 AM	74								
10	8:00 AM	75								
11	9:00 AM	80								
12	10:00 AM	83								
13	11:00 AM	86								
14	12:00 PM									
15	1:00 PM	87								
16	2:00 PM	88								

F52xx08

FIGURE 52-8 Replacing the missing data by lines.

F52xx08: This figure shows the missing data replaced by lines between the existing points.

How can I handle the appearance of hidden data?

Often, we plot data, such as daily sales, and filter the data in the spreadsheet. In this situation, Excel gives us a choice to either continue showing all the data in the chart or to just show the filtered data in the chart. The file Hidden.xlsx contains the daily sales of a product for a year. If I graph the data as a line chart, I see the chart shown in Figure 52-9.
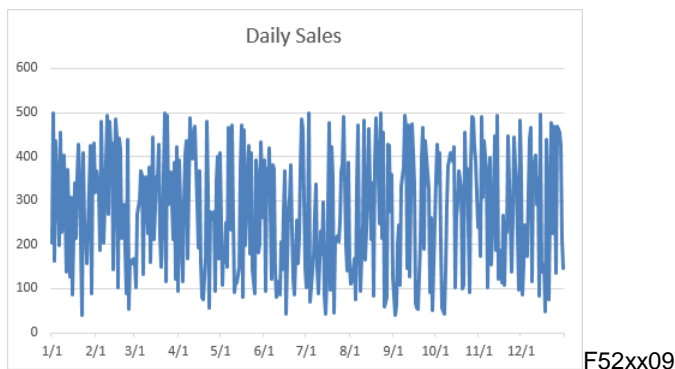

F52xx09

FIGURE 52-9 Daily product sales.

F52xx09: This figure shows daily product sales.

Right-click the chart and click Select Data, click Hidden And Empty Cells from the Select Data Source dialog box, and then select the Show Data In Hidden Rows And Columns check box at the bottom of the Hidden And Empty Cell Settings dialog box shown earlier in Figure 52-7. Then, even if I filter the data, all the data points will still show in the chart. For example, as shown in Figure 52-10, the data is filtered to show only the December sales, but the chart still shows all the daily sales for the entire year. If I did not check the Show Data In Hidden Rows And Columns check box, only December sales would be visible in the chart.
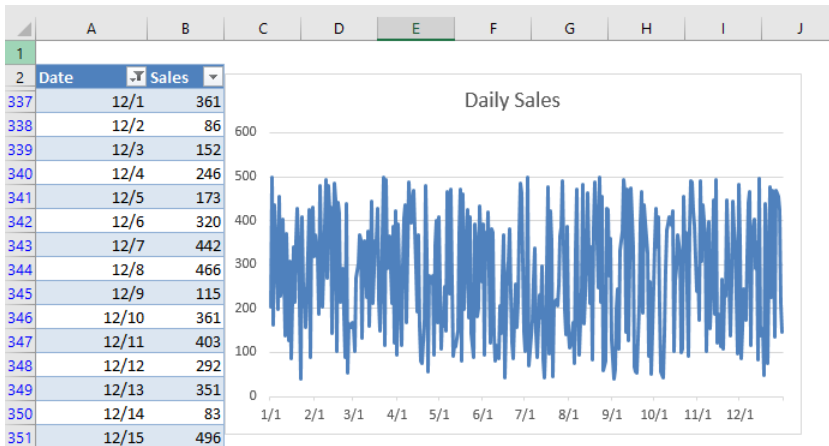
F52xx10

FIGURE 52-10 Filtering the data but not the chart.

F52xx10: This figure shows filtered data, but the chart shows all the data.

How can I use pictures to add bling to my column graphs?

The magnitude of product sales is usually summarized by means of boring columns or bars in which the height of the column or width of the bar is proportional to the product sales. Wouldn't it be more fun to summarize a product's sales with a picture of your product, scaled proportionally to the actual sales? To illustrate the idea, check out the file Picturegraph.xlsx and the chart shown in Figure 52-11. Let's assume you sell books.
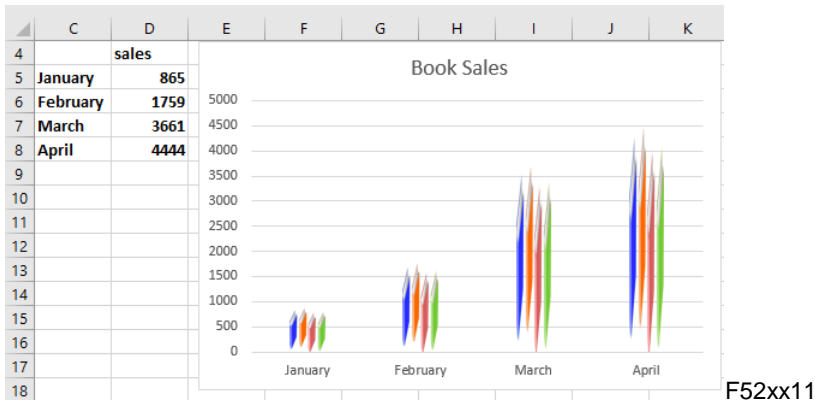

F52xx11

FIGURE 52-11 Book sales summarized with book images.

F52xx11: This figure shows book sales summarized by means of book images whose relative sizes correspond to the actual book sales.

To begin, select the range C5:D8. On the Insert tab, click Insert Column Or Bar Chart and select the first chart in the 2D Column options (clustered column.) Then right-click any column. Select Fill

(above the context menu) and then click Picture; you will see the window shown in Figure 52-12. After typing Books in Bing Image Search and pressing Enter, you are presented with many pictures of books. After selecting the book image you want and clicking Insert, your picture is inserted into the graph, as shown previously in Figure 52-11, with the size of the books proportional to the actual sales.
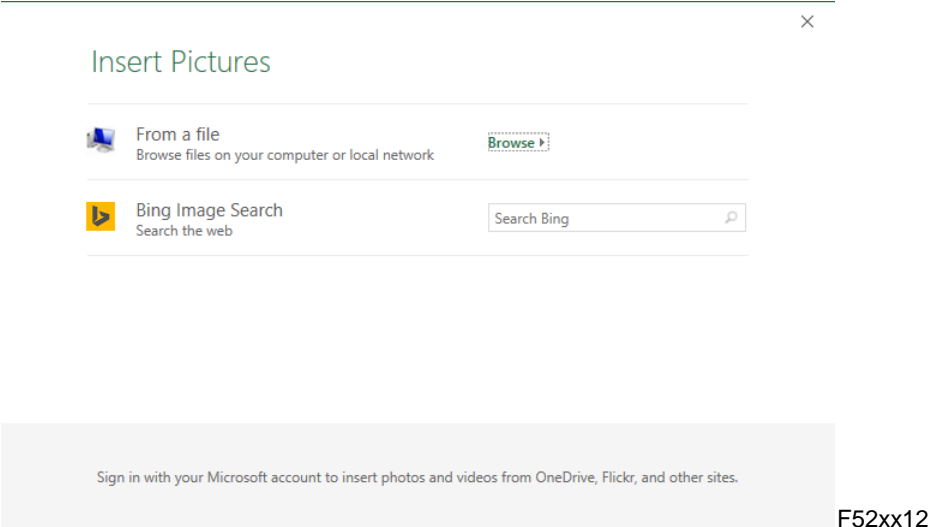

F52xx12

FIGURE 52-12 The Insert Pictures dialog box.

F52xx12: This figure shows how to insert a book image into a column graph.

I charted annual sales data in a column graph, but the years do not show up as column labels. What did I do wrong?

The file Categorylabels.xlsx (see Figure 52-13) contains the annual product sales for the years 2007–2010. When I create a column graph with the chart data source being D5:E9, the chart fails to show the year on the x-axis because Excel thinks I want the year charted as a series. If I omit the Year category label in the upper-left corner of the source range and use D20:E24 as the range for the chart, my chart shows the year on the x-axis, as desired.
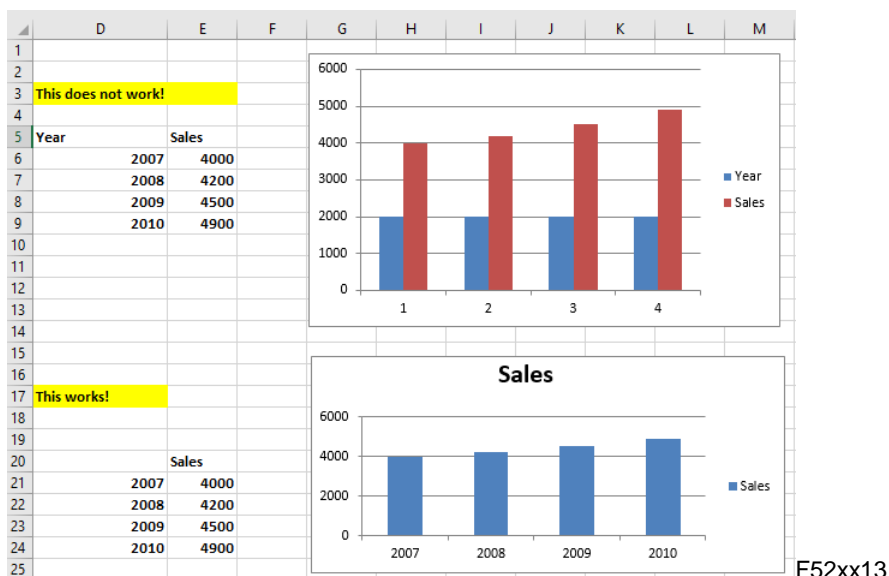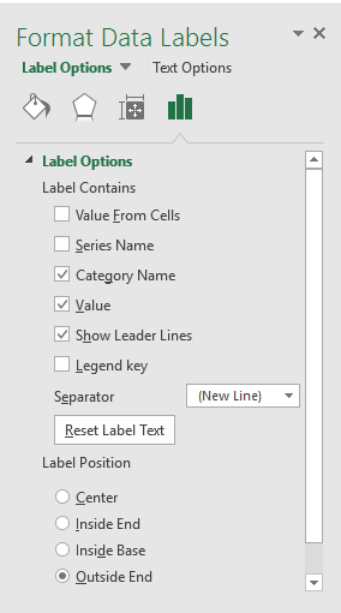
F52xx13

FIGURE 52-13 Omitting the category label to graph column charts correctly.

F52xx13: This chart shows that omitting a category label causes the years to show up in the x-axis.

How can I include data labels and data tables in my charts?

Often, we want to insert data labels next to our columns or bars or perhaps show a nice table below our chart. To illustrate this process, look at the file Labelsandtables.xlsx. In this file, you are given sales of four product categories during the current month. To begin, I summarize this data in a column graph and place a label containing the product name and actual sales above the column. After creating a column graph in the usual fashion, select the column series in the chart and click the **+** sign to the right of the chart. Then click the arrow to the right of Data Labels and click More Options. In the Format Data Labels pane, after filling in the Label Options section as shown in Figure 52-14, you will now see the chart shown in Figure 52-15.

F52xx14

FIGURE 52-14 The settings needed to show the sales and series name on separate lines.

F52xx14: This figure shows the settings needed to show the sales and series name on separate lines.
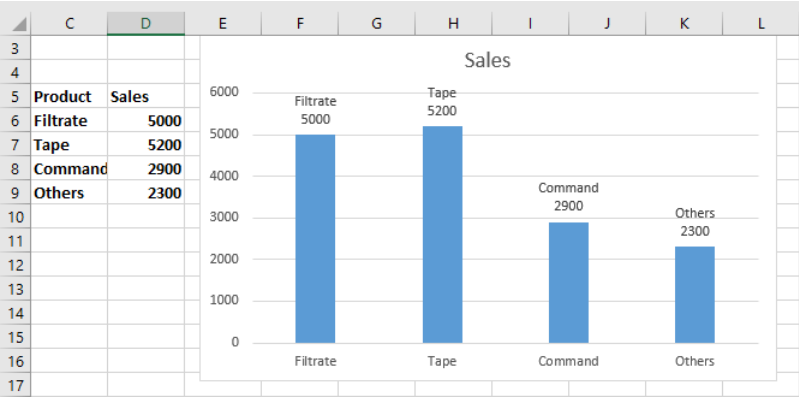
F52xx15

FIGURE 52-15 The category names and sales included in charts.

F52xx15: This figure shows the category and actual sales amount for each product.

I will now show how to place a data table summarizing the sales below the chart. Simply select the category axis and click the **+** sign to the right of the chart. After clicking Data Table, you will see the data table shown in Figure 52-16.
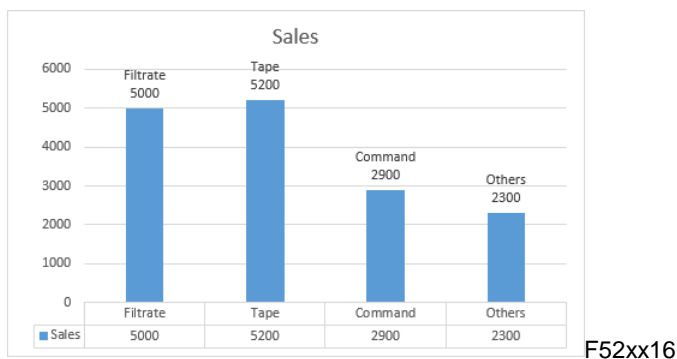
F52xx16

FIGURE 52-16 The sales summarized with a data table.

F52xx16: This figure shows sales summarized with a data table below the chart.

If you want to see more data table options, simply select the triangle to the right of the Data Table item.

How can I use Excel 2016 to place data labels on a chart based on the contents of cells?

Beginning with Excel 2013, Excel made it possible to place data labels from cells directly on charts. To illustrate the idea, examine the file Labelsfromcells.xlsx shown in Figure 52-17.
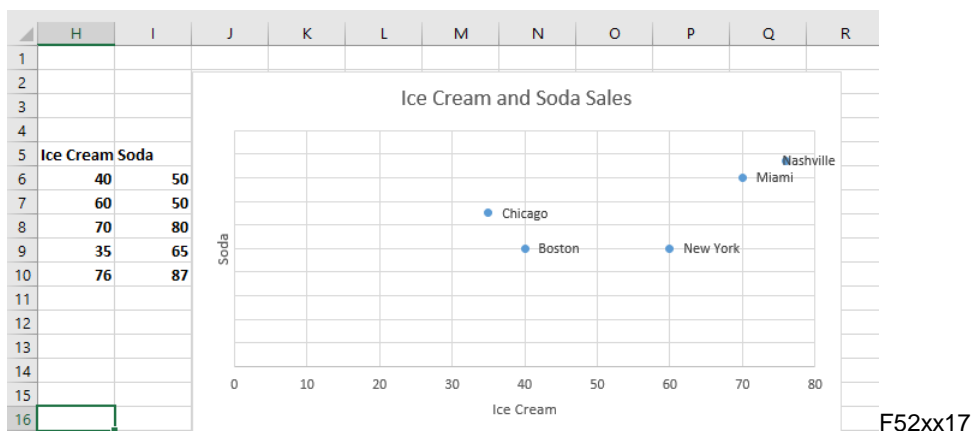
F52xx17

FIGURE 52-17 A scatter chart with labels from cells.

F52xx17: This figure shows a scatter chart with the city labels created from the cell range G6:G10.

To begin creating this graph, select the cell range H5:I10 and choose the first scatter chart option that's displayed when you select Insert Scatter (X, Y) Or Bubble Chart (the icon with the dots, to the right of the pie chart icon). This creates the scatter chart that you see in Figure 52-17, without the city labels. To create the city labels, first select the chart. On the Chart Tools Design tab, select Add Chart Element, select Data Labels, and then More Data Label Options. In the Format Data Labels pane,

check Value From Cells, and clear Y Value. Now you can select the cell range G6:G10 to insert the city labels in the chart, as shown in Figure 52-17.

How can I track sales-force performance over time?

The file Salestracker.xlsx lists the monthly sales by your crack sales force during January through May (see Figure 52-18).

	D	E	F	G	H	I
1	p	h	up			
2	q	i	down			
3	u	g	flat			
4						
5		January	February	March	April	May
6	Lebron	85	66	81	61	56
7	Wade	82	63	74	78	75
8	Dirk	45	100	115	127	150
9	Manning	75	88	89	76	83
10	Brady	96	90	98	76	93
11	Halliday	75	73	79	91	95
12	Britney	98	91	109	99	84
13	Lindsay	83	84	97	81	98
14	Paris	106	98	84	93	82
15	JLO	104	88	109	101	115
16	Emma	115	94	105	101	107
17	Melo	118	98	128	126	108
18	KD	100	114	104	116	131
19	Vick	112	122	102	124	107
20	Rodgers	127	114	116	139	108

F52xx18

FIGURE 52-18 The monthly sales data.

You want to use icons (up, down, or right arrow) to track during each month whether a salesperson's ranking has improved, declined, or stayed the same. You could use Excel's icons sets (described in Chapter 24, "Conditional formatting"), but then you would have to insert a set of icons for each month, which is a tedious task. A more efficient (although not as aesthetically pleasing) way to create these icons is to enter an *h* when you want an up arrow, enter an *I* when you want a down arrow, and enter a *g* when you want a flat arrow. Then, if you change the font to Wingdings 3, you will see the arrows you want. This is because the letters of the alphabet correspond in Wingdings 3 to the symbols shown in Figure 52-19.

	J	K	L
22	Letter	Wingdings 3	
23	a	⇨	
24	b	⇦	
25	c	⇨	
26	d	⇦	
27	e	⇨	
28	f	←	
29	g	→	
30	h	↑	
31	i	↓	
32	j	↖	
33	k	↗	
34	l	↙	
35	m	↘	
36	n	↔	
37	o	↕	
38	p	▲	
39	q	▼	
40	r	△	
41	s	▽	
42	t	◀	
43	u	▶	
44	v	◁	
45	w	▷	
46	x	◤	
47	y	◢	
48	z	◣	

F52xx19

FIGURE 52-19 Correspondence between letters and Wingdings 3 symbols.

F52xx19: This figure shows the correspondence between letters and Wingdings 3 symbols.

To create the icons shown in Figure 52-20, I proceed as follows:

- Copying from J6 to J6:N20 the formula =RANK(E6,E$6:E20,0) computes each person's sales rank during each month.

- Copying from O6 to O7:R20 the formula =IF(K6<J6,"h",IF(K6>J6,"l","g")) creates an *h* if the person's rank has improved, an *l* if the person's rank has declined, and a *g* if the salesperson's rank has stayed the same.

- After changing the font in the range O6:R20 to Wingdings 3, I see the icons shown in Figure 52-20.

	January	February	March	April	May	rank January	rank February	rank March	rank April	rank May	trend Feb	trend March	trend April	trend May
p	h	up												
q	i	down												
u	g	flat												
Lebron	85	66	81	61	56	10	14	13	15	15	↓	↑	↓	→
Wade	82	63	74	78	75	12	15	15	12	14	↓	→	↑	↓
Dirk	45	100	115	127	150	15	4	3	2	1	↑	↑	↑	↑
Manning	75	88	89	76	83	13	10	11	13	12	↑	↓	↓	↑
Brady	96	90	98	76	93	9	9	9	13	10	→	→	↓	↑
Halliday	75	73	79	91	95	13	13	14	10	9	→	↓	↑	↑
Britney	98	91	109	99	84	8	8	4	8	11	→	↑	↓	↑
Lindsay	83	84	97	81	98	11	12	10	11	8	↓	↑	↓	↑
Paris	106	98	84	93	82	5	5	12	9	13	→	↓	↑	↓
JLO	104	88	109	101	115	6	10	4	6	3	↓	↑	↓	↑
Emma	115	94	105	101	107	3	7	6	6	6	↓	↑	→	→
Melo	118	98	128	126	108	2	5	1	3	4	↓	↑	↓	↓
KD	100	114	104	116	131	7	2	7	5	2	↑	↓	↑	↑
Vick	112	122	102	124	107	4	1	8	4	6	↑	↓	↑	↓
Rodgers	127	114	116	139	108	1	2	2	1	4	↓	→	↑	↓

F52xx20

FIGURE 52-20 Icons used to track change in salesperson performance.

F52xx20: This figure shows how icons can be used to show changes in salesforce performance.

The advantage of this approach is that you can use IF statements to easily customize the conditions that define the icons.

How can I create a band chart to check whether inventory is within acceptable levels?

Often, we need to track a quantity (such as inventory, cash on hand, or number of accidents) and want to track whether the quantity remains between historical upper and lower limits. A band chart provides a useful tool to monitor how a process changes over time. Figure 52-21 shows an example of a band chart (see the file Bandchart.xlsx).

	A	B	C	D	E	F	G
1	Limits						
2	Lower Limit	5					
3	Upper Limit	25					
4		Jan	Feb	Mar	Apr	May	Jun
5	Lower Limit	5	5	5	5	5	5
6	Upper Limit	20	20	20	20	20	20
7	Values	25	33	27	4	26	29
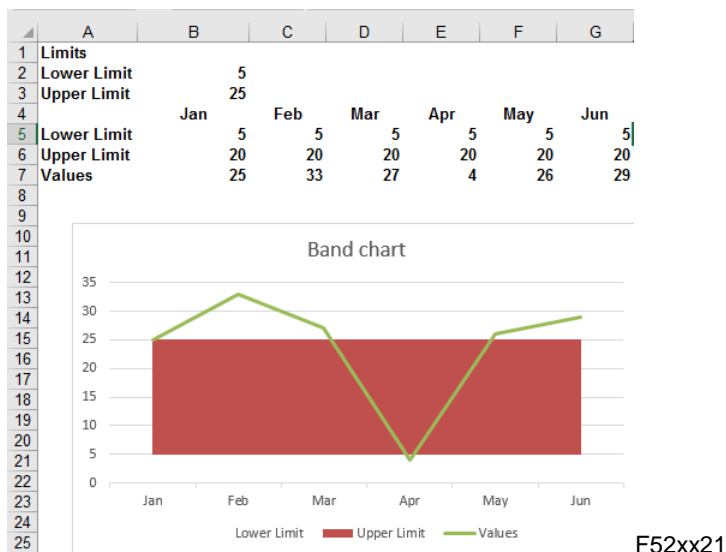
F52xx21

FIGURE 52-21 A band chart summarizing the inventory levels.

To create the band chart, proceed as follows:

- Enter in B2 your lower limit on inventory (5) and in B3 your upper limit (25) on inventory.

- In row 5, enter the lower limit for each month by copying from B5 to C5:G5 the formula =$B$2.

- Copying from B6 to C6:G6 the formula = $B$3-$B$2 computes Upper Limit-Lower Limit. You label this row *Upper Limit* because this row will be used to generate the line representing your upper inventory limit of 25 units.

- Select the range A4:G7, and on the Insert tab, select Insert Line Or Area Chart, and click Stacked Column (the second option in the 2-D Column section). Change the chart title to Band chart.

- Right-click the Value series (the green bar), and select Change Series Chart Type. In the Change Chart Type dialog box, under Choose The Chart Type And Axis For Your Data Series, for the Upper Limit series, select Area (the first option from the Area section), and for the Values series, select the Line chart (the first chart option in the Line section). Click OK.

- Right-click the Lower Limit series in the chart (a blue bar) and select Fill. From the Fill menu, select No Fill.

My band chart shows that I am having great difficulty maintaining inventory levels between the desired lower and upper limits.

How can I store a chart as a template?

I just created a beautiful band chart. You might think that each time you want to create a band chart, you need to repeat the previously described steps. This is not the case. You can save the band chart (or any other chart) as a template and pull up the chart settings whenever you need them. To illustrate the idea, open the file Bandchart.xlsx, right-click the chart, select Save As Template, and give the chart any name you want. (I chose *Band*.) Now suppose you want a band chart just for the months January–March. Simply select the data range A4:D7, and then, in the Charts group on the Insert tab, select the dialog box launcher in the lower-right corner of the Charts group. Select the All Charts tab, and then select Templates in the left pane. Then browse to the chart template you want, click OK, and you are finished!

How can I use a thermometer chart to portray progress against a target?

A thermometer chart shows the actual values of a quantity, such as revenues, stacked within a column that shows a target value. The resulting chart (shown in Figure 52-22 and in the file Thermometer.xlsx) resembles a thermometer, hence the name, *thermometer chart*.
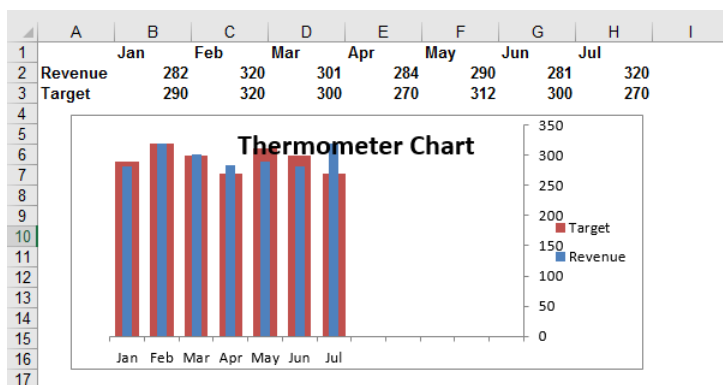
FIGURE 52-22 A thermometer chart.

F52xx22: This figure shows a thermometer chart.

To create a thermometer chart, proceed as follows:

- Select the range A1:H3, click Insert Column Or Bar Chart on the Insert tab, and select Clustered Column chart (first icon) from the 2-D Column options.

- Right-click the revenue series (a blue bar) in the chart, and then select Format Data Series. In the Format Data Series pane, select Secondary Axis.

- In the Format Data Series pane, with the revenue series still selected, set Series Overlap to 0% and Gap Width to 261**%**.

- Click the target series (a red bar), and then set Series Overlap to 0% and Gap Width to 48%.

You will now see the chart shown in Figure 52-22. You might have to adjust the gap widths to obtain a chart you like. Making the gap width for the target series smaller, for example, makes the red bars wider; making the gap width for revenue larger, makes the blue bars narrower.

How can I create dynamic chart labels?

You have probably encountered workbooks with charts in which you change a worksheet input and the chart labels do not change in response to the worksheet inputs. This situation often causes confusion. You will now learn how to link series labels and chart titles to worksheet cells. To illustrate the idea (see the file Dynamiclabels.xlsx and Figure 52-23), suppose you want to chart the future GDP in the United States and China. You want the chart title to contain the year in which China's GDP passes the US GDP, and you want the series label to contain the annual growth rate for each nation. In C5 and C8, you can change the estimated growth rates from their current values of 3 percent for the US and 10 percent for China.
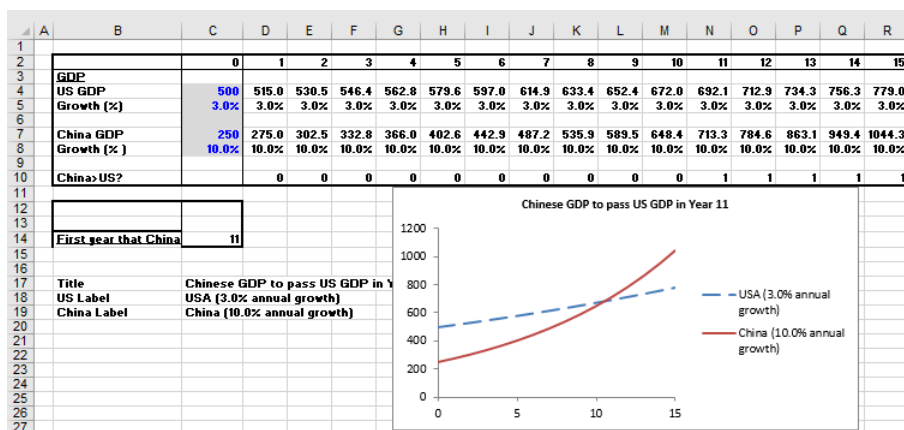
FIGURE 52-23 Creating dynamic labels.

The key idea is to link your chart title and labels to cells that change when the growth rates change. Proceed as follows:

- Copying from D10 to E10:R10 the formula =IF(D7>=D4,1,0), enters a 1 if the GDP for China is at least as big as the US GDP.

- In cell C14, determine the year in which China passes the US with the formula =IFERROR(MATCH(1,D10:R10,0),"none"). Note that if China never passes the US, this formula enters None.

- In cell C17, the formula =IF(C14="none", "US stays on top","Chinese GDP to pass US GDP in Year "&TEXT(C14,"0")) creates the chart title you want. Note if China never passes the US, your chart title will be **US stays on top**. Otherwise, your chart title is linked to C14, so the chart title will contain the year in which China passes the US. The *"0"* in the TEXT function ensures that the year is formatted as an integer.

- In cell C18, the formula ="USA ("&TEXT(C5,"0.0%")&" annual growth)" creates the chart title for the US series. The "*0.0%*" portion of the TEXT function ensures that the growth rate is formatted as a percentage.

- In cell C19, the formula ="China ("&TEXT(C8,"0.0%")&" annual growth)" creates the chart title for the China series.

Now you are ready to create the chart with dynamic labels, proceeding as follows:

- Using the Ctrl key, select the noncontiguous range C2:R2, C4:R4, C7:R7, and then create a scatter chart with smooth lines: click the Insert tab, click Insert Scatter (X, Y) Or Bubble Chart, and then click Scatter With Smooth Lines (the third option) in the Scatter section.

- On the Design tab, select Add Chart Element in the Chart Layouts group, select Chart Title, and then select Centered Overlay. In the formula bar, type an equal sign, click cell C17, and press the Enter key. You now have a dynamic chart label.

- Right-click Series 1 in the chart (the USA GDP series blue line), and choose Select Data. Then click Edit in the Legend Entries (Series) area on the left, and fill in the Edit Series dialog box, as shown in Figure 52-24: Enter the Series Name as ='Dynamic labels'!$C$18, leave the other defaults, and click OK in both dialog boxes.
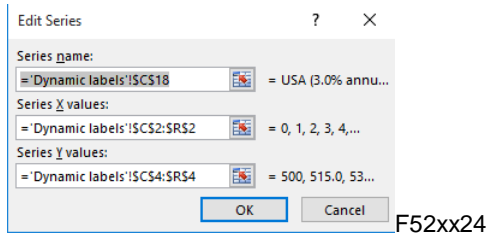
F52xx24

FIGURE 52-24 Creating the dynamic USA series label.

F52xx24: This figure shows the settings needed for the USA series label to include the annual US growth rate.

This links the USA series label to cell C18, which contains the annual growth rate. In a similar fashion, you link the China series label to cell C19. You now have the completed chart with dynamic labels.

How can I use check boxes to control which series are charted?

You may recall from Chapter 27 that a check box can be used to toggle the contents of a cell between True and False. It turns out that if Excel sees an #N/A error in a cell, the cell will not generate a point appearing in the chart. Therefore, if you do not want to chart a series, you simply use an IF formula to make the charted series #N/A when the check box puts a False in a cell. You can see an example of this in Figure 52-25.

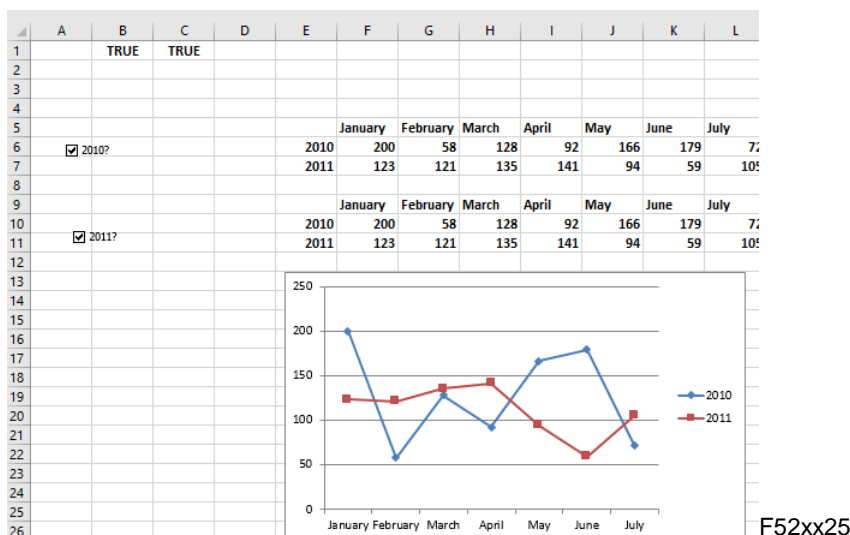|	A	B	C	D	E	F	G	H	I	J	K	L
1		TRUE	TRUE									
2												
3												
4												
5						January	February	March	April	May	June	July
6	☑ 2010?				2010	200	58	128	92	166	179	7:
7					2011	123	121	135	141	94	59	10!
8												
9						January	February	March	April	May	June	July
10					2010	200	58	128	92	166	179	7:
11	☑ 2011?				2011	123	121	135	141	94	59	10!
12												

F52xx25

FIGURE 52-25 Using check boxes to control the series appearing in a chart.

F52xx25: This figure shows how check boxes can be used to control series appearing a chart.

Open the file Checkbox.xlsx. To begin, you use the methods described in Chapter 27 to create two check boxes: one to control the 2010 series and another to control the 2011 series. The 2010 check box controls whether cell B1 is True or False, and the 2011 check box controls cell C1. The original data is in E6:L7. Copying the formula =IF($B$1,F6,NA()) from F10 to F11:L11 simply copies the original data for the year if the year's check box is checked, and it enters an #N/A if the year's check box is unchecked. Now select the cell range E9:L11 as the source data for a Line With Markers chart (click the Insert tab, click Insert Line Or Area Chart, and select the Line With Markers chart, the fourth chart in the 2-D Line section). Unchecking a year's check box will hide a year's data in the chart; checking the check box will reinsert the year's data in the chart.

How can I use a list box to choose the series to be charted?

Suppose your spreadsheet (see Listbox.xlsx) contains 2007–2011 sales in the East, West, Midwest, and South regions. You want an easy way to control which series is charted. A list box (see Chapter 27) provides an easy way to control the charted series. To begin, go the Developer tab on the ribbon, and in the Controls group, click Insert, and then select the List Box option from the Form Controls section. Add a list box to the spreadsheet, right-click it, and select Format Control. In the Format Control dialog box, select $A$14:$A$17 as the Input Range and select $H$2 as the Cell Link. Click OK. Now, with an intelligent use of the INDEX function, you can use cell H2 to control the charted series, as shown in Figure 52-26.
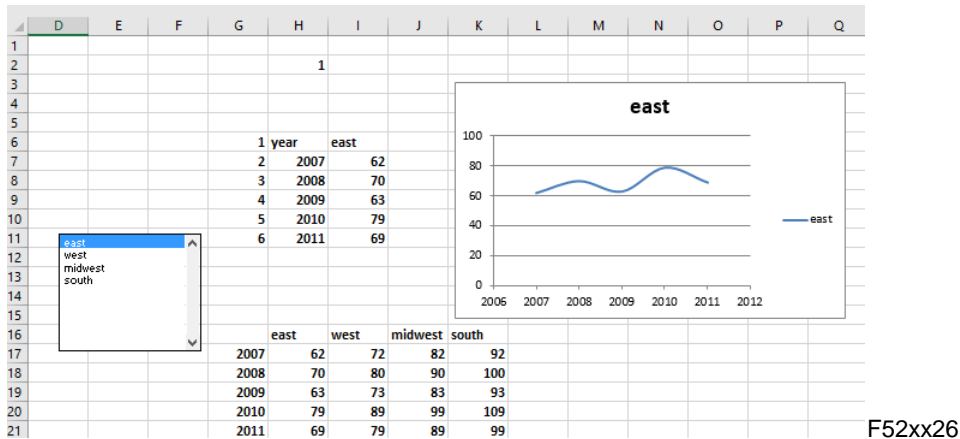
FIGURE 52-26 Using a list box to control the charted series.

F52xx26

Copying from I7 to I8:I10 the formula =INDEX($H$16:$K$21,G7,$H$2) pulls the correct series. For example, in the list box shown in Figure 52-26, the East region was selected. This places a 1 in cell H2. Then my INDEX function pulls the first column (column H) of data as desired. Now, select the range H7:Y11 and create a scatter chart by clicking Insert Scatter (X, Y) Or Bubble Chart, and then selecting the Scatter chart) option. You will see that when you click a region in the list box, the correct series is displayed on all the charts.

How do I create a Gantt chart?

Often, a project requires that a number of projects be completed. A Gantt chart portrays the time each project begins. Shown in Figure 52-27 (see file Gantt.xlsx) is a Gantt chart for a project consisting of five tasks. To create this chart, proceed as follows:

- Select the cell range F3:H8, and create a stacked 2D bar chart (click Insert Column Or Bar Chart, and select Stacked Bar, the second option in the 2-D Bar section).

- Right-click the Start series (a blue bar), and after selecting Fill, choose No Fill to hide the Start series.

- Right-click the vertical axis (the tasks on the left), select Format Axis, and then, in the Format Axis pane, select the check box Categories In Reverse Order to ensure that Task 1 is listed first instead of last.
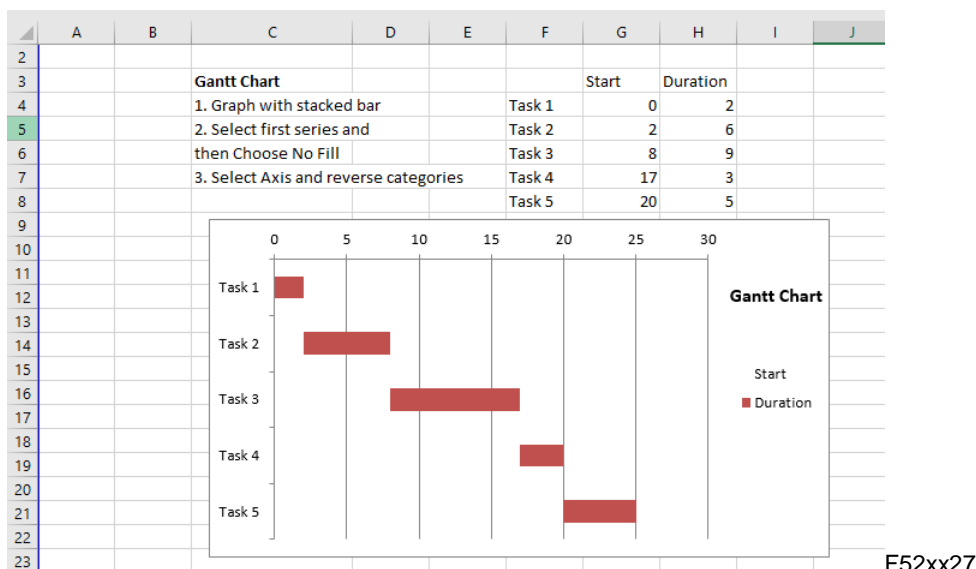
	Start	Duration
Gantt Chart		
1. Graph with stacked bar	Task 1	0	2
2. Select first series and	Task 2	2	6
then Choose No Fill	Task 3	8	9
3. Select Axis and reverse categories	Task 4	17	3
	Task 5	20	5

F52xx27

FIGURE 52-27 A Gantt chart.

How do I create a chart based on sorted data?

Suppose you have sales in a number of states (see Figure 52-28 and the file Sortedgraph.xlsx), and you want the graph to list the states in descending order of sales, as shown in Figure 52-29. To create this chart, you need to reorganize the data in columns J–L so that the sales data is sorted in descending order.

	E	F	G	H	I	J	K	L
8	State	Sales	Original rank	Revised		Rank	State	Sales
9	NJ	40	1	1		1	NJ	40
10	NY	18	6	6		2	Wva	20
11	Ind	14	10	10		3	Min	19
12	Cal	15	9	9		4	Mic	19
13	KY	10	13	13		5	Fla	19
14	Ari	10	13	14		6	NY	18
15	Ala	10	13	15		7	Va	17
16	Min	19	3	3		8	Mo	16
17	Ill	13	11	11		9	Cal	15
18	Mic	19	3	4		10	Ind	14
19	Mo	16	8	8		11	Ill	13
20	Fla	19	3	5		12	Pa	13
21	Pa	13	11	12		13	KY	10
22	Wva	20	2	2		14	Ari	10
23	Va	17	7	7		15	Ala	10

F52xx28

FIGURE 52-28 The sales data for a sorted graph.

To accomplish this goal, I proceed as follows:

- Copying from G9 to G10:G23 the formula =RANK(F9,$F$9:$F$23,0), I compute the rank of each state's sales. For example, New York ranks sixth. Note, however, that Kentucky, Alabama, and Arizon have the same level of sales. To sort the states in descending order of sales, I need to associate a unique rank with each state.

- Copying from H9 to H10:H23 the formula =G9+COUNTIF($G$8:G8,G9) creates a unique rank for each state by increasing the rank of a state with a tied rank each time a tied rank occurs.

- Copying from K9 to K10:L23 the formula =INDEX(E$9:E$23,MATCH($J9,$H$9:$H$23,0),1) sorts the states and sales based on descending sales.

- Now, creating a column graph based on K9:L23 (select Clustered Column in the Charts group) yields the graph shown in Figure 52-29.
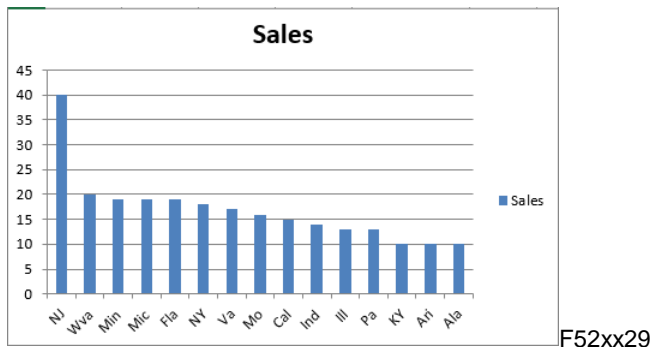
F52xx29

FIGURE 52-29 The sales sorted in descending order.

F52xx29: This chart shows the sales sorted in descending order.

How can I create a histogram that automatically updates when I include new data?

In Chapter 41, you learned how to use the Data Analysis template to create a histogram, Unfortunately, histograms created with the Analysis ToolPak will not update if the existing data is changed or if new data is added. Using the Excel table feature, you can easily create histograms that automatically adjust to changes in the source data. The file Dynamichistograms.xlsx illustrates the idea. (See Figure 52-30.)

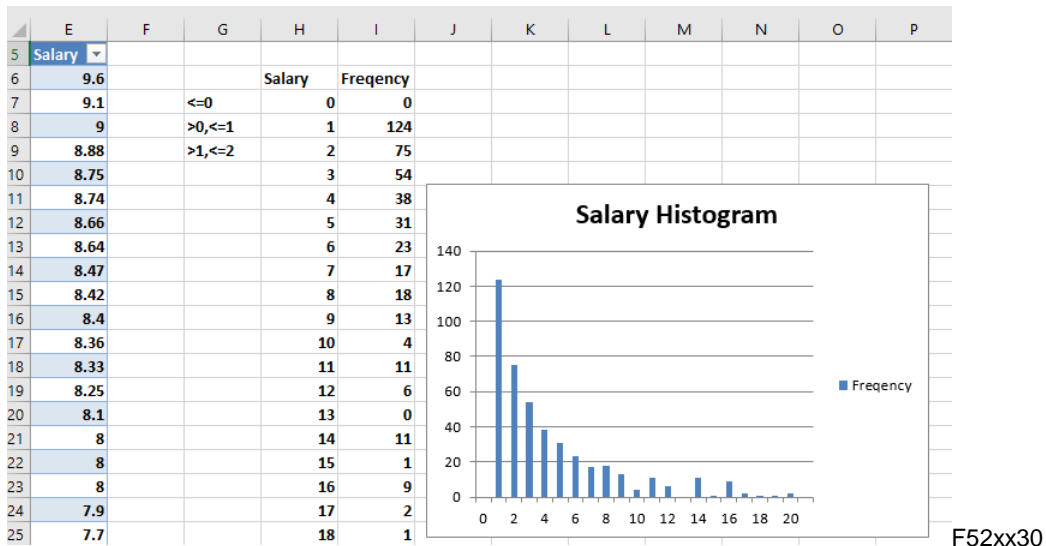| E	F	G	H	I
Salary				
9.6			Salary	Freqency
9.1		<=0	0	0
9		>0,<=1	1	124
8.88		>1,<=2	2	75
8.75			3	54
8.74			4	38
8.66			5	31
8.64			6	23
8.47			7	17
8.42			8	18
8.4			9	13
8.36			10	4
8.33			11	11
8.25			12	6
8.1			13	0
8			14	11
8			15	1
8			16	9
7.9			17	2
7.7			18	1

F52xx30

FIGURE 52-30 A dynamic histogram.

F52xx30: This figure shows a dynamic histogram that updates when new data is included.

Column E contains NBA player salaries in millions of dollars for the 2003–2004 season. To begin, I selected the range E5:E446 and made that range a table. Then I entered the bin ranges for my histogram in the range H7:H28. Note that row 28 will calculate the number of salaries that are larger than $20 million. Now I will use the FREQUENCY function to count how many salaries fall into each bin range. The FREQUENCY function (see Chapter 89) is an *array function*. To use this function, you need to first select the range the function populates (in this case I7:I28), then enter the function syntax, and then press Ctrl+Shift+Enter. Here, after selecting I7:I28, type in the formula **=FREQUENCY(E6:E446,H7:H27)** and press Ctrl+Shift+Enter. Excel now enters in cell I7 the number of players (0) with a salary less than or equal to 0, in cell I8 it enters the number of salaries >0 and <=1 million (124), and so on to cell I27, where Excel enters the number of players with salaries >19 and <=20 million (2), and finally in cell I28 it enters the number of players with a salary >20 million (0). To create the dynamic histogram, simply select the cell range H7:I28 and create a column graph (select Clustered Column in the Charts group). You now have a dynamic histogram, which will automatically update to account for changes in the source data. To prove that the histogram updates, add a few salaries of $30 million in column E (rows 447 and higher). You will now see a new column appear on the right side of the graph.

How can I add conditional colors to a chart?

Suppose you are charting for each month actual and targeted sales and you want months in which you perform at 90 percent of target or better to be graphed in blue; 75 percent of target or worse in green, and other months in red. The file Condcolors.xlsx (Figure 52-31) shows how this is done. The trick to create this chart is to put the data for each color in a different row (see rows 19–21). To begin,

I place sales I want colored blue in row 19 by copying from F19 to G19:M19 the formula =IF(F13/F14>F15,F13/F14," "). Then, I place the sales I want colored red in row 20 by copying from F20 to G20:M20 the formula =IF(AND(F13/F14>F16,F13/F14<=F15), F13/F14," "). Finally, I place the sales for months that should appear in green in row 20 by copying from F21 to G21:M21 the formula =IF(COUNT(F19:F20)=0,F13/F14," "). Now, select the range E18:M21 and create a column chart (select Clustered Column in the Charts group). If you want to change the color for any series, select the series/column and click the paintbrush icon to the right of the chart; then select Color, and choose the color theme you want to to use. You can select a new combination of colors that apply to all your series.
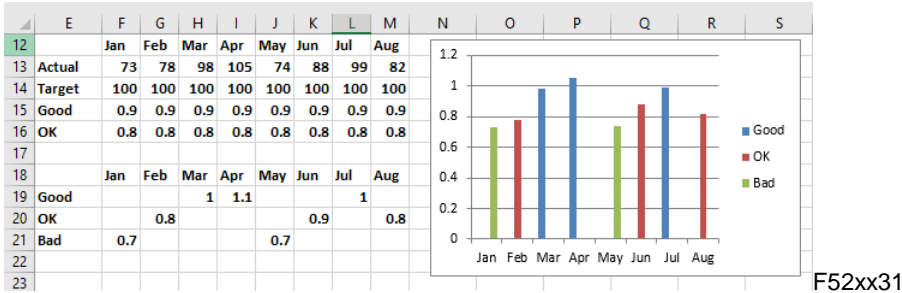

	E	F	G	H	I	J	K	L	M
12		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
13	Actual	73	78	98	105	74	88	99	82
14	Target	100	100	100	100	100	100	100	100
15	Good	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
16	OK	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
17									
18		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
19	Good			1	1.1			1	
20	OK		0.8				0.9		0.8
21	Bad	0.7				0.7			
22									
23									

F52xx31

FIGURE 52-31 Showing how blue indicates a good month, green a bad month, and red a so-so month.

How can I use waterfall charts to track progress toward a sales target or to break down the components of a sales price?

Waterfall charts, originally developed by the McKinsey consulting firm, are often used to show progress toward a final cash position or to break down a company's total revenue into cost components and profit. In this section, I show how to use Excel 2013 or earlier versions to create waterfall charts. Late in the chapter, I show how Excel 2016 makes it much easier to create waterfall charts. The file Waterfallcharts.xlsx contains several examples of waterfall charts.

In the worksheet All Positive (see Figure 52-32), I create a waterfall chart for a situation in which all the cash flows are positive. I want the chart to show the monthly progress toward my cash flow goal of $3,270. After entering my cash flows in column C, I need to simply track in column B my cumulative cash flow. Copying it from B3 to B4:B7, the formula =B2+C2 computes the cumulative cash flow through the end of each month. Next, I select the cell range A1:C7 and create a stacked column chart (the second choice in the 2-D Column section). Change the chart title to Waterfall Chart: All Amounts Positive. Right-click the Base series (blue bar), and choose No Fill from the Fill menu; this yields the waterfall chart shown in Figure 52-32.
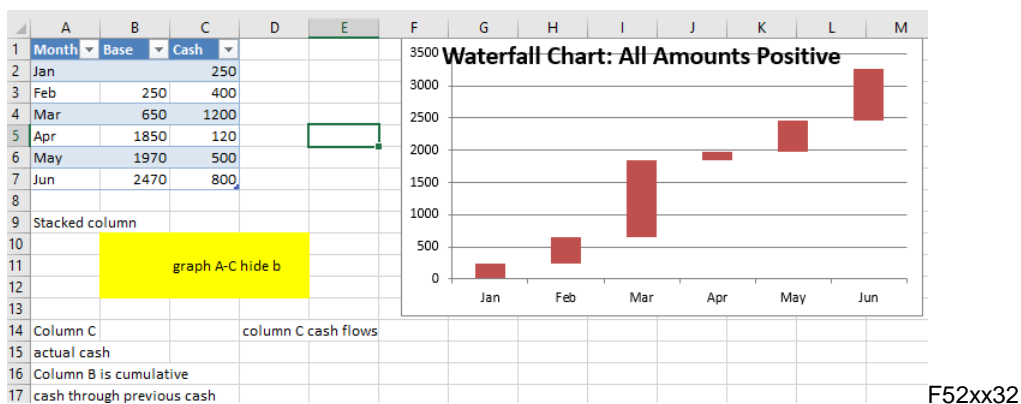
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Month	Base	Cash										
2	Jan		250										
3	Feb	250	400										
4	Mar	650	1200										
5	Apr	1850	120										
6	May	1970	500										
7	Jun	2470	800										
8													
9	Stacked column												
10													
11			graph A-C hide b										
12													
13													
14	Column C			column C cash flows									
15	actual cash												
16	Column B is cumulative												
17	cash through previous cash												

F52xx32

FIGURE 52-32 A waterfall chart where all the cash flows are positive.

Figure 52-33 (see the worksheet Positive And Negative) shows a waterfall chart in a situation for which some cash flows are negative.

After entering the positive cash flows in column C and negative cash flows in column D, I compute the total cash flow through the end of each month by copying from E2 to E3:E7 the formula =E1+C2-D2. Next, by copying from B2 to B3:B7 the formula =E1-D2, I compute in column B the cumulative cash flow through the last month, adjusted by the current month's negative cash flow. After selecting the range A1:D7 and creating a stacked column chart (the Clustered Column option), all I have to do is hide column B (the Base series), and then I have the waterfall chart shown in Figure 52-33. (To hide the column, right-click a blue bar, and then select No Fill from the Fill menu.) Also, I changed the chart title to **Waterfall Chart Positive and Negative Value**.
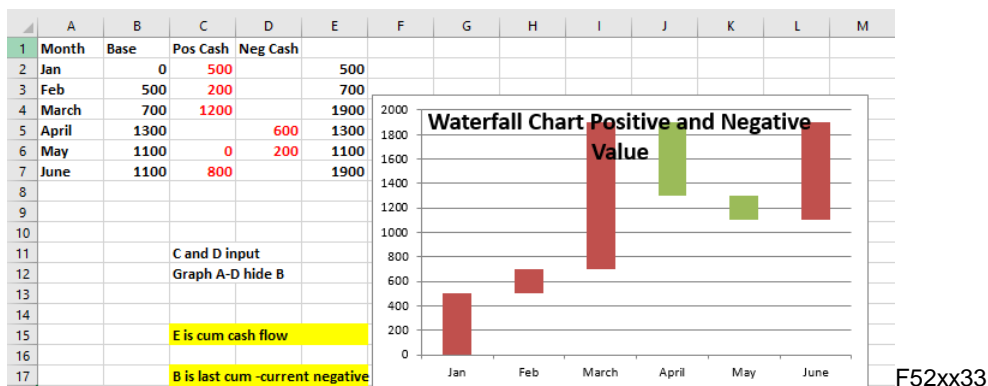

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Month	Base	Pos Cash	Neg Cash									
2	Jan	0	500		500								
3	Feb	500	200		700								
4	March	700	1200		1900								
5	April	1300		600	1300								
6	May	1100	0	200	1100								
7	June	1100	800		1900								
8													
9													
10													
11			C and D input										
12			Graph A-D hide B										
13													
14													
15			E is cum cash flow										
16													
17			B is last cum -current negative										

F52xx33

FIGURE 52-33 A waterfall chart where some cash flows are negative.

By following the method used in the Positive And Negative worksheet, you can easily break down

a company's revenue into its cost components (including profit). See the worksheet Profitability Waterfall and Figure 52-34.
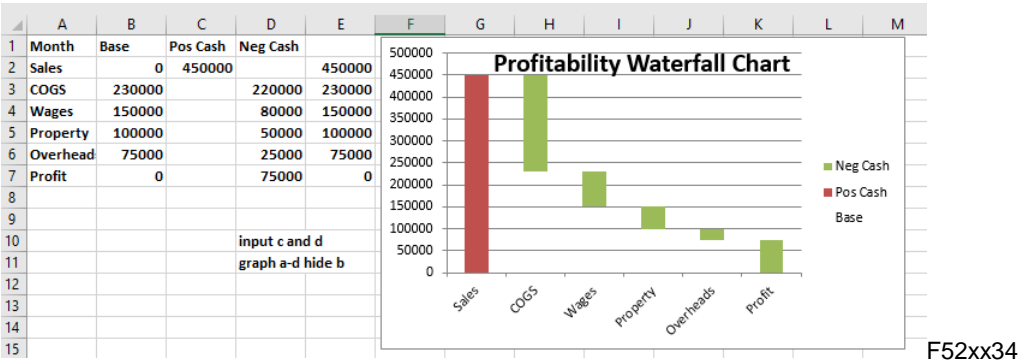
	A	B	C	D	E
1	Month	Base	Pos Cash	Neg Cash	
2	Sales	0	450000		450000
3	COGS	230000		220000	230000
4	Wages	150000		80000	150000
5	Property	100000		50000	100000
6	Overhead	75000		25000	75000
7	Profit	0		75000	0
8					
9					
10				input c and d	
11				graph a-d hide b	
12					
13					
14					
15					

F52xx34

FIGURE 52-34 A profitability waterfall chart.

F52xx34: This figure shows a waterfall chart that decomposes my $450,000 in revenue into its costs and profit components.

How can I use the GETPIVOT data function and Excel's table feature to create dynamic dashboards?

Often, we download monthly, quarterly, or weekly sales data and want to summarize the sales data in charts that will automatically update to include new data. Knowledge of Excel's GETPIVOTDATA function (see Chapter 43) and Excel's table feature (see Chapter 26) makes this relatively straightforward (see the file Randy.xlsx.) Let's suppose you download weekly sales data for four product categories (filtrate, tape, command, and abrasives) at four stores (Menard's, Target, Lowes, and Home Depot). Your goal is to set up a dashboard that allows you to quickly chart the weekly sales data at a given store and control which product categories appear in the chart. As shown in Figure 52-35, your data is downloaded in columns D–G. I made the range D4:G243 a table. This action will ensure that a PivotTable based on this data will automatically update to include new data when you refresh the table.

	D	E	F	G
4	WEEK	Category	Store	Revenue
5	3	Abrasives	Lowes	2043
6	12	Safety	Menards	2343
7	3	Tape	Home Depot	1414
8	12	Command	Target	1820
9	9	Tape	Home Depot	943
10	7	Tape	Target	1219
11	7	Command	Menards	1156
12	11	Abrasives	Lowes	2127
13	12	Safety	Menards	1315
14	3	Tape	Target	1580
15	10	Abrasives	Home Depot	1598
16	4	Command	Lowes	1000
17	7	Tape	Menards	1087
18	7	Abrasives	Menards	1728
19	1	Abrasives	Target	1911
20	7	Abrasives	Menards	1563
21	2	Tape	Target	2482
22	7	Safety	Lowes	1534
23	12	Safety	Menards	1471
24	2	Abrasives	Lowes	990
25	11	Tape	Lowes	1580
26	1	Safety	Target	2389
27	2	Safety	Menards	2263

F52xx35

FIGURE 52-35 The sales data.

F52xx35: This figure shows the source sales data for your dynamic dashboards.

I now create a PivotTable by clicking the Insert tab and then PivotTable in the Tables group. In the PivotTable Fields pane, I drag the Week field to the Rows area, Store and Category to the Columns area, and Revenue to the Values area. This PivotTable (shown in Figure 52-36) summarizes the weekly sales for each category in each store.

Sum of Revenue	Lowes				Lowes Total	Menards				Menards Total	Home Depot
Row Labels	Abrasives	Safety	Tape	Command		Abrasives	Safety	Tape	Command		Abrasive
1		1065		1247	2312	3772	526	3466		7764	3272
2	2349	4510			6859	6220	3296	2159		11675	1921
3	2797	1233	2046	6335	12411	3472		959	2369	6800	
4	1501	3822	1180	1000	7503	6018	2212			8230	
5	1940		833	2945	5718	708		501	597	1806	1758
6			1918	6494	8412	4145	6205	4653		15003	
7	3049	3228			6277	3291	2303	6472	1156	13222	3580
8	4208	2890	1873		8971	910		1494	3776	6180	2445
9			2052	2825	4877	6265		1888		8153	
10	6117		1875		7992			2138		2138	4807
11	2127	1971	4461	2394	10953	3596	1169			4765	
12		1542	4786	850	7178	1124	7565	7264	2431	18384	2471
13			1196		1196				3400	3400	
14	1455				1455						
Grand Total	25543	20261	21024	25286	92114	39521	23276	####	13729	107520	20254

F52xx36

FIGURE 52-36 A PivotTable summarizing the category sales by store.

F52xx36: This PivotTable shows the weekly category sales summarized by store.

Now I am ready to use the GETPIVOTDATA function to extract the data needed to create the charts I want. To begin, I create a drop-down list (see Chapter 40) in cell AG8 (still in the Model worksheet), which can be used to select a store. Then I create check boxes (see Chapter 27) for each category that can be used to control the range AH9:AK9. These cells control which categories appear in my chart. Then I copy from AH11 to the range AH11:AK24 the formula =IF(AH$9=FALSE,NA(),IFERROR(GETPIVOTDATA("Revenue",$I$11,"WEEK",$AG11,"Category",AH$10,"Store",$AG$8)," ")). If I select the check box for a category, this formula extracts the weekly sales for the category; if the category is unchecked, then an #N/A is entered in the cell. Also, if 0 sales occurred, the IFERROR portion of the formulas ensures that sales of 0 are entered. Next, I make the range AG10:AK24 a table so that any charts based on this range will update automatically to include the new data. Figure 52-37 shows how the source data for my chart appears if I want to summarize abrasives, safety equipment, and tape sales at Lowes.

	AE	AF	AG	AH	AI	AJ	AK
3							
4		☑ Abrasives	☐ Command				
5							
6		☑ Tape	☑ Safety				
7			store				
8			Lowes				
9				TRUE	FALSE	TRUE	TRUE
10			Week	Abrasives	Command	Tape	Safety
11			1	0	#N/A	0	1065
12			2	2349	#N/A	0	4510
13			3	2797	#N/A	2046	1233
14			4	1501	#N/A	1180	3822
15			5	1940	#N/A	833	0
16			6	0	#N/A	1918	0
17			7	3049	#N/A	0	3228
18			8	4208	#N/A	1873	2890
19			9	0	#N/A	2052	0
20			10	6117	#N/A	1875	0
21			11	2127	#N/A	4461	1971
22			12	0	#N/A	4786	1542
23			13	0	#N/A	0	0
24			14	1455	#N/A	0	0

F52xx37

FIGURE 52-37 The source data for the chart.

F52xx37: This figure shows the source data, data validation drop-down list, and check boxes used to create source data for the chart.

Now it is time for the payoff! Select the range AG10:AK24 and create a scatter chart with smooth lines by selecting Insert Scatter (X, Y) Or Bubble Chart in the Charts group, and then Scatter With Smooth Lines from the Scatter section. The finished product is shown in Figure 52-38. This chart can show sales at any store of any category combination and will update when new data is downloaded.
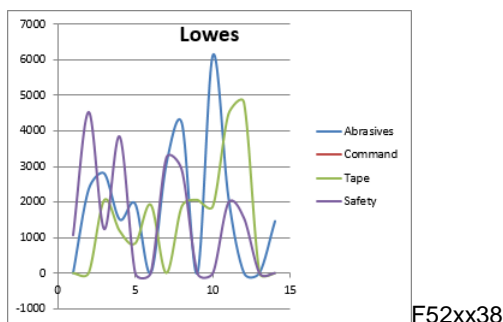
F52xx38

FIGURE 52-38 A dynamic dashboard summarizing the sales at Lowes of abrasives, tape, and safety equipment.

F52xx38: This figure shows a summary of abrasives, tape, and safety-equipment sales at Lowes.

How can I insert a vertical line in a chart to separate pre- and post-merger performance?

Suppose your company was merged with another company on January 10, 2011 (see the file Verticalline.xlsx and Figure 52-39), and you are charting the daily sales. You might want to insert a vertical line in your graph to indicate the date of the merger. If you draw the vertical line with the Excel shapes feature, and the chart is moved, the line will be in the wrong place. To remedy this problem, I begin by selecting the range E10:F32 and creating a scatter chart with lines (the third option in the Scatter section). In the range B15:C16, I enter the date of the merger and the lower and upper limits on the y coordinates for my vertical line. (In this case, lower limit = 0 and upper limit =120.) Next, I copy the range B15:C16 and then right-click the chart. Clicking the Paste icon inserts the vertical line on the January 10 date.
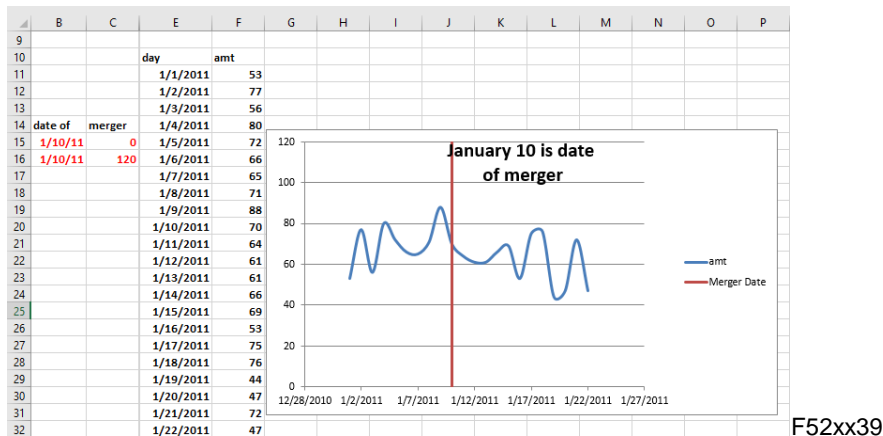
F52xx39

FIGURE 52-39 Using a vertical line to indicate January 10, 2011 was the merger date.

F52xx39: This figure uses a vertical line to indicate the date of a merger.

How can I use a radar chart to portray how basketball team members differ in strength, speed, and jumping ability?

The file Radar.xlsx summarizes data for four athletes on the dimensions of speed, strength, and agility. First, select the range C2:F6. On the Insert tab, select the radar chart icon (Insert Surface Or Radar Chart; shown in Figure 52-40). From the options displayed, select Radar With Markers (the second option in the Radar section), and you will have the radar chart shown in Figure 52-41.

F52xx40

FIGURE 52-40 The radar chart icon.

F52xx40: This figure shows the icon used to create a radar chart.
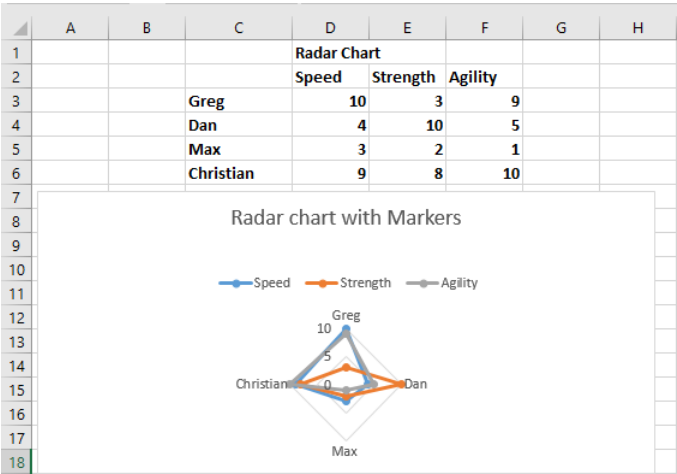
F52xx41

FIGURE 52-41 A radar chart with markers.

F52xx41: This figure shows a radar chart with markers.

The center of the radar chart indicates a score of 0; the farther a marker is from the center, the better the score. The chart makes it easy to see, for example, that Max scores poorly on all measures, while Christian scores well on all three measures.

I know I can use a scatter chart to display how two variables change. How can I use a bubble chart to summarize the variation of three variables?

While a scatter chart allows you to see how two variables vary, a bubble chart allows you to visually summarize three variables. The file Bubble.xlsx (see Figure 52-42) contains for several countries/regions the percentage variance in sales relative to the budget, the annual growth in sales, and each country/region's market size. To summarize this data in a bubble chart, select the range D9:F14, click the drop-down arrow by the scatter chart icon, and choose Bubble (the first bubble-chart option). Change the title of the chart to Area Bubble Chart. After adding (as described earlier in the chapter) a data label for each bubble, based on the country/region (cell range C10:C14), and placing the labels above each bubble, I obtain the bubble chart shown in Figure 52-42. (To add the labels, in

the Format Data Labels pane, under Label Options, check the first choice, Value From Cells, and uncheck Y Value. Now you can select the cell range C10:C14 to insert the labels for the countries/regions in the chart. Under Label Position, select Above.) The areas of the bubbles are proportional to the market size of each country/region. For example, the US bubble contains 50 percent more area than the bubble for China.
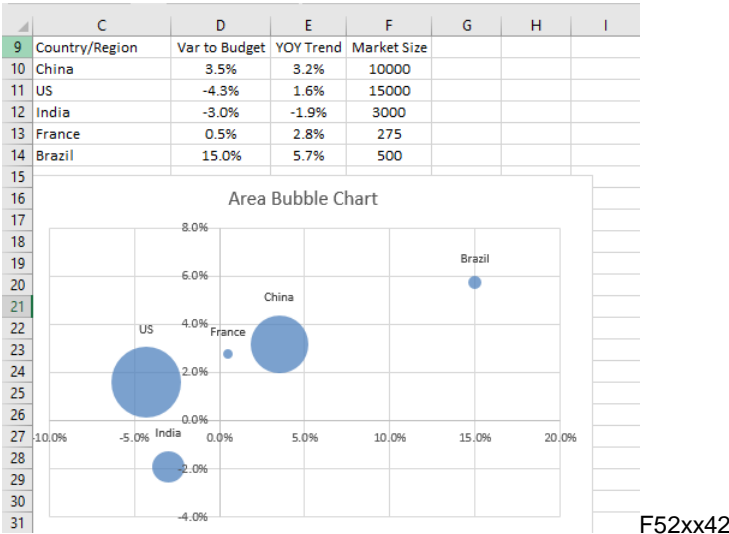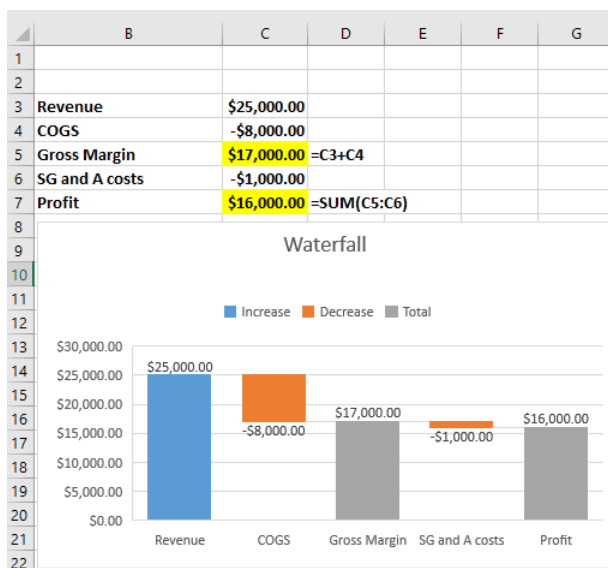

F52xx42

FIGURE 52-42 An area bubble chart.

F52xx42: This figure shows changes in variance and sales related to market size.

How do I create waterfall charts with Excel 2016?

Earlier in the chapter, I showed you how versions of Excel preceding Excel 2016 could be tricked into creating waterfall charts. Here, I show you how easy it is to create waterfall charts using Excel 2016. In the workbook Watefallpandltemp.xlsx (see Figure 52-43), you are given data for a company's revenue; cost of goods sold (COGS); selling, general, and administrative expenses (SG&A); and profit. You want to create a waterfall chart that shows the progress from a revenue of $25,000 to a profit of $16,000. Gross margin and profit are totals and not *changes*, so they will need to be treated differently.

F52xx43

FIGURE 52-43 A waterfall chart that captures revenue, costs, and profit.

F52xx43: This figure shows a waterfall chart that is commonly used to show how costs reduce revenue to profit.

To begin, select the cell range B3:C7. On the Insert tab, select the Insert Waterfall Or Stock Chart option shown in Figure 52-44.
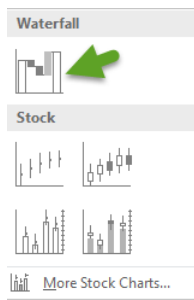

F52xx44

FIGURE 52-44 The Insert Waterfall Or Stock Chart icon.

F52xx44: This figure shows the Insert Waterfall Or Stock Chart option.

Next, as shown in Figure 52-45, I select the Waterfall chart option.

F52xx45

FIGURE 52-45 Selecting the Waterfall chart option.

F52xx45: This figure shows how to select a waterfall chart.

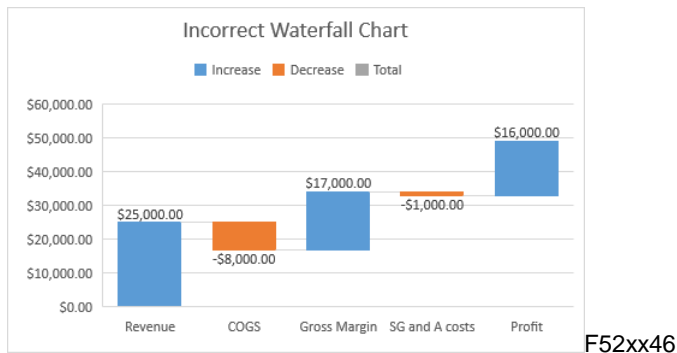You will obtain the waterfall chart shown in Figure 52-46.

F52xx46

FIGURE 52-46 An incorrect waterfall chart.

The problem with this chart is that the Gross Margin and Profit columns should be anchored to the x-axis. To accomplish this goal, click the Gross Margin column twice, right-click the column, and choose Format Data Point; in the Format Data Point pane, select Set As Total, and then click the Profit column and select Set As Total for that column as well. You now obtain the correct waterfall chart shown earlier in Figure 52-43, which shows the total columns highlighted in gray. You now clearly see the path from a revenue of $25,000 to a profit of $16,000.

As another example of a waterfall chart, consider the data in the file Waterfallcashtemp.xlsx from this chapter's Templates folder (see Figure 52-47), which gives the opening cash balance at the beginning of the year, the monthly changes in cash balance, and the end-of-year cash balance.

	A	B	C	D
1	Opening	110000		
2	Jan	-15000		
3	Feb	25000		
4	Mar	-100000		
5	Apr	-50000		
6	May	25000		
7	Jun	38000		
8	Jul	25000		
9	Aug	-15000		
10	Sep	25000		
11	Oct	50000		
12	Nov	75000		
13	Dec	-25000		
14	Closing	168000	=B1+SUM(B2:B13)	

F52xx47

FIGURE 52-47 The cash flow for one year.

After selecting the cell range A1:B14 and creating a waterfall chart, I again find that the first and last points need to be changed to a total (click the Opening column twice, then right-click it, select Format Data Point, and select Set As Total; then select the Closing column and select Set As Total for that column as well.) You now obtain the waterfall chart shown in Figure 52-48.
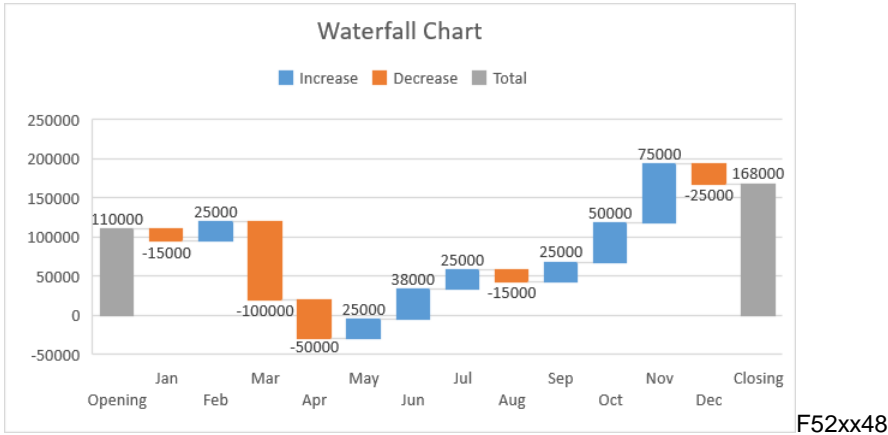

F52xx48

FIGURE 52-48 A cash-flow waterfall chart.

F52xx48: This figure shows a waterfall chart that displays cash-flow progress during a calendar year.

How do I use an Excel 2016 treemap and sunburst chart to summarize hierarchical data?

Treemap charts (also known as *mosaic* charts) and sunburst charts enable you to visualize hierarchical data. Hierarchical data is a way to organize data with multiple one-to-many relationships. The structure is based on the rule that one parent can have many children, but children can have only one parent. For example, if I look at the sales of a product based on *quarter of year*, *month of year*, and *week of month*, then the *quarter* is the parent with three children (the months in the quarter), and each month has either four or five children, corresponding to the weeks in the month.

As another example, consider a small bookstore. The parents in this case might be types of books (like children's books, art and photography books, and so on). The children of the art and photography category might be crafts and coffee-table books. For children's books, the children might be books in categories such as Age 3–5 and Age 6–8. Age 3–5 books might have subcategories of first-readers, ABCs, and Tolstoy for Tots.

Based on the Microsoft Office blog post entitled "Breaking down hierarchical data with treemap and sunburst charts" (*https://blogs.office.com/2015/08/11/breaking-down-hierarchical-data-with-treemap-and-sunburst-charts/)*, let's create examples of treemap and sunburst charts. In the file Treemapbookstoretemp.xlsx from this chapter's Templates folder (see Figure 52-49), I have the revenue for different book categories at a small bookstore.

	GENRE	SUB-GENRE	TOPIC	REVENUE
2	Arts & Photogra	How-to Crafts		$ 2,711
3		Coffee-table	Photography	$ 2,309
4	Children's Book	Baby Books		$ 16,092
5		Age 3-5	1st Readers	$ 24,514
6			ABCs	$ 17,771
7			Tolstoy for Tot	$ 13,295
8		Age 6-8		$ 14,046
9		Pre-Teen & Teen		$ 18,046
10	Computers & In	Troubleshooting		$ 4,527
11	Mystery	Crime	Fiction	$ 11,186
12			True Crime	$ 8,790
13		Spy		$ 6,516
14			True Spy	$ 3,809
15	Nonfiction	Health	Diet	$ 3,293
16			Fitness	$ 6,891
17		History		$ 1,131
18	Magazine	Fashion	Women's	$ 7,315
19			Men's	$ 2,222
20		Home		$ 2,612
21		Other		$ 3,140
22		Sports	Sport's Illustra	$ 8,009
23			MMA	$ 4,257
24	Romance	Break up	Teen	$ 6,205
25			Young Adult	$ 25,193
26			Audiobooks	$ 3,045
27		Make Up		$ 15,050
28	Science Fiction	Apocalyptic		$ 10,200
29		Comics		$ 3,456

F52xx49

FIGURE 52-49 The data for treemap and sunburst charts.

F52xx49: This figure shows bookstore sales.

To create a treemap chart, begin by selecting the cell range A1:D29. Then, on the Insert tab, select Insert Hierarchy Chart, the treemap icon shown in Figure 52-50.

F52xx50

FIGURE 52-50 The treemap icon.

F52xx50: This figure shows the Treemap icon.

From the set of options shown in Figure 52-51, I choose the Treemap option and obtain the chart shown in Figure 52-52.
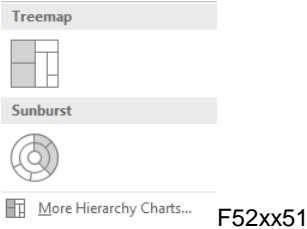

F52xx51

FIGURE 52-51 Options for selecting a treemap or sunburst chart.

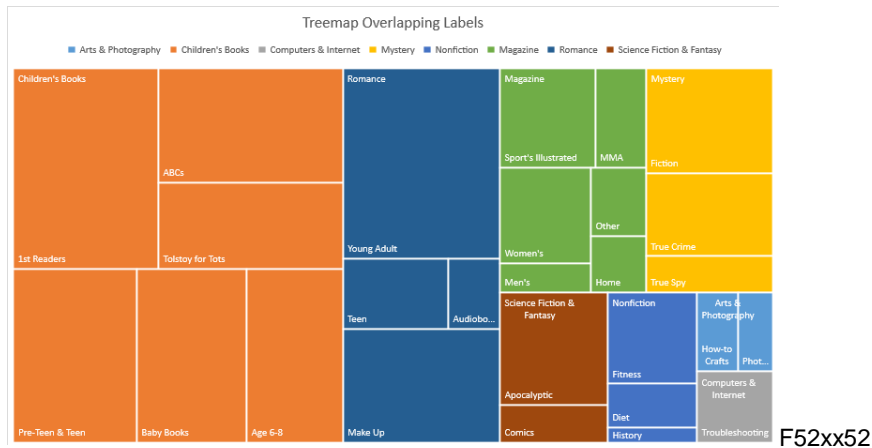F52xx51: This figure shows the options for a treemap and sunburst chart.

FIGURE 52-52 A treemap chart with overlapping labels.

F52xx52: This figure shows a treemap chart with overlapping labels.

This treemap chart shows the fraction of total sales belonging to each type of book. Notice that all book types with the same parent are portrayed with the same color. This chart shows, for example, that a little less than half your sales (actually 42 percent) come from children's books. You can hover over a rectangle to get the data. If you right-click any rectangle, you can select Format Data Series and change the labels to banner labels, which places the labels for each parent alone in its own rectangle.

Note that because of a lack of space, your treemap chart does not show the Age 3–5 label. A sunburst chart solves this problem. If I again select the cell range A1:D29 and choose the Sunburst chart option, I obtain the sunburst chart shown in Figure 52-53. (See the file Sunburstfinal.xlsx.)
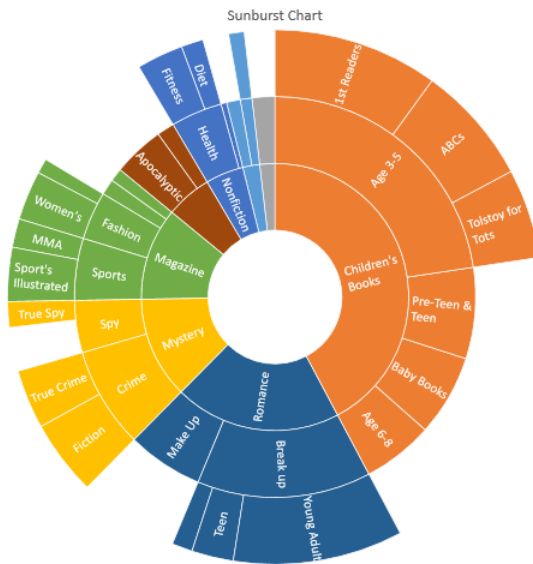
Sunburst Chart

F52xx53

FIGURE 52-53 A sunburst chart for the bookstore.

F52xx53: This figure shows a sunburst chart.

Note that I now see the breakdown of Age 3–5 books into its three subcategories. Of course, in the sunburst chart, it is more difficult to determine the fraction of all sales derived from each type of book.

Problems

The file Cakes.xlsx contains for each month the number of salespeople and revenue for a bakery. Use this data for Problems 1–4.

1. Create a combination chart with a secondary axis to summarize the monthly number of salespeople and revenues.

2. Graph monthly revenue and insert data labels on the chart.

3. Graph the number of salespeople and insert a data table below the chart.

4. Plot monthly sales using a cake image for the columns, rather than a column chart.

The file Hiddenpivot.xlsx contains the sales of candy between 2009 and 2017. Use this data for Problems 5 and 6.

5. Filter the data so that only 2013 sales appear in the spreadsheet but all the data appears in the chart.

6. Summarize each year's sales in a PivotTable, and also show the percentage improvement in sales from year to year.

7. Using the data in the file Salestracker.xlsx, highlight the top two salespeople each month with an up arrow, the bottom two with a down arrow, and the others with a flat (right) arrow.

8. The Indiana University basketball team considers at least 50 deflections per game a good performance and 30 or fewer deflections a poor performance. In the last six games, Indiana had 25, 55, 45, 43, 59, and 39 deflections. Plot this data on a band chart.

9. Plot the data of Problem 8 on a column chart in which good defensive games are highlighted in green, bad games in red, and other games in orange.

10. During its first year of operation, a firm's revenue was $5 million and expenses were $6 million. For different assumed growth rates in expenses and revenues, plot 10 years of revenues and expenses; ensure that the graph title shows the year that the revenue first exceeds expenses.

The file Crimedata.xlsx contains annual violent crimes, property crimes, and murders in the United States. Use this data for Problems 11–12.

11. Create a graph showing the number of crimes each year. Use check boxes to control which series are plotted.

12. Create a histogram that summarizes murders that updates automatically when new data is included.

13. The following table contains performance reviews for five employees. Use a radar chart to summarize the performance reviews.

Person	Hard working	Collegial	Completes tasks on time	Punctual
Wayne	1	2	3	4
Vivian	5	6	7	8
Greg	10	9.5	9	8.5
Jen	9	2	9	4
Wanda	1	1.5	2	2.5

14. A project consists of five activities. The start time and duration of each activity are given below. Summarize this data in a Gantt chart.

Activity	Start time	Duration
A	0	4
B	3	6
C	5	7
D	6	8
E	3	6

15. A company's profit, revenue, and cost breakdown for a year are given below. Summarize this data in a waterfall chart.

Item	Amount
Revenue	$300,000
Profit	$65,000
Labor Costs	$100.000
Material Costs	$80,000
Overhead Costs	$55,000

16. The file Problem16data.xlsx contains information about lunch and breakfast sales at Mel's Diner. Create a treemap chart to summarize this sales data. Hint: You will need to aggregate the data,

17. Use the data in the file Problem16data.xlsx to create a sunburst chart that summarizes restaurant sales.