UNIVERSITY OF MARYLAND
University College

Learning Resource

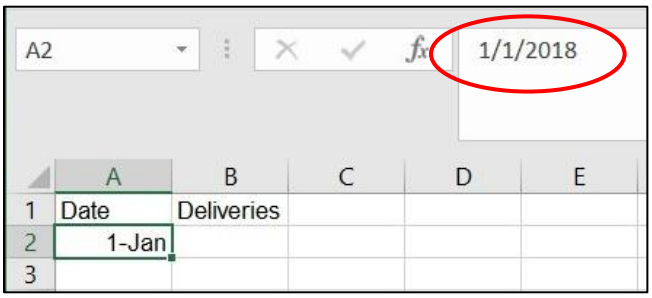
Generating Data with AutoFill and RAND Functions

You already had an introduction to charts and data visualization in Excel in the GCF tutorials. In this tutorial, we'll be taking that discussion one step further.

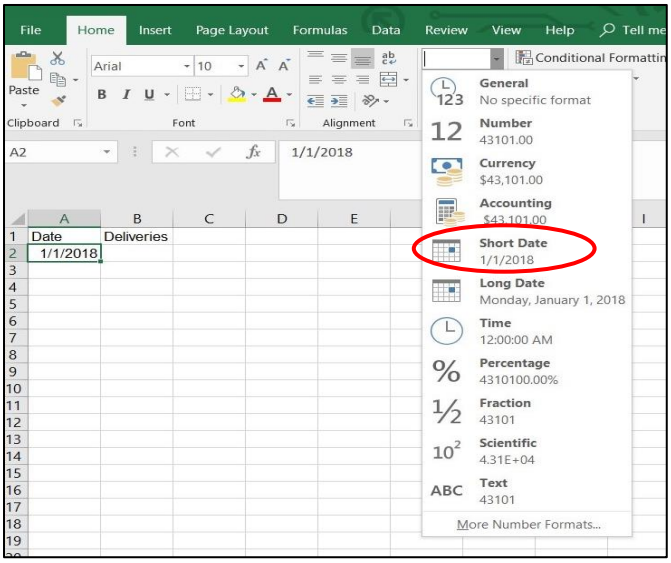
1. For this part of the tutorial, we are going to prepare our data from scratch. This way we'll also investigate some of the automated 'autofill' features of Excel.

   Open Excel and choose 'Open a Blank Workbook'.
   In Cell A1 type the word 'Date' (without the quotes) and hit 'Tab' on your keyboard. Note that in Excel when you hit Tab the cursor or 'active' cell moves to the RIGHT. When you hit Enter, the cursor or 'active' cell moves DOWN.

   In Cell B1 type the word 'Deliveries' and hit Enter (or Tab).
   In Cell A2 type 'Jan 1' and hit Enter. Note that Excel reformats the date to 1-Jan AND that in the formula bar, the current year also appears.

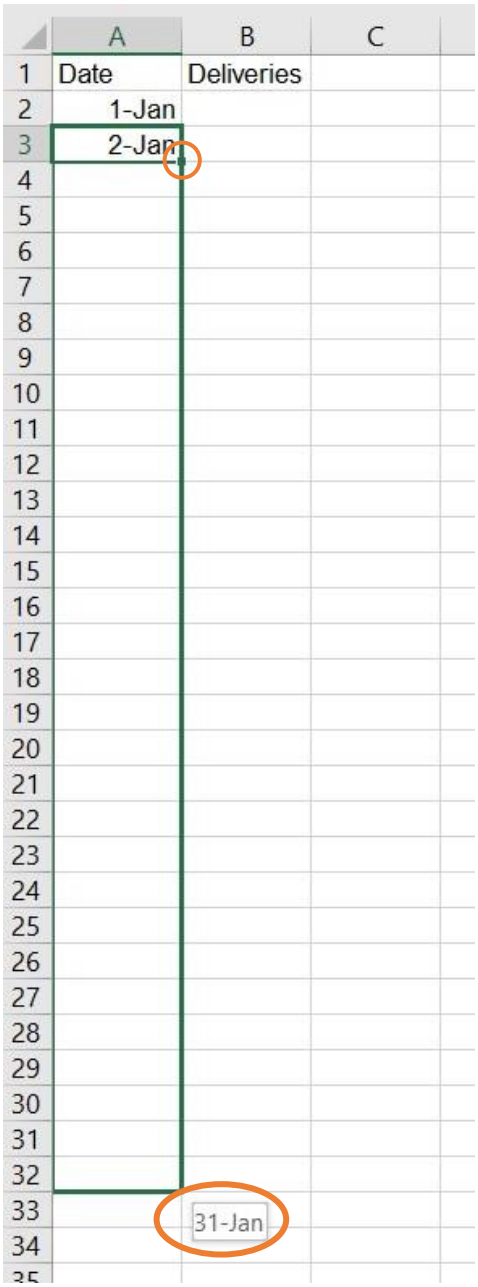


   If we want the year to appear in the cell, we can choose the Number Format dropdown box and choose 'Short Date'.



In Cell A3 type ‘Jan 2’ and hit Enter. Other ways to enter the date of Jan 2 are ‘1-2’, ‘jan 2’ or ‘1/2’.

2. Once we have two dates entered, we can use Excel’s autofill feature, by selecting the two cells, A2 and A3 and dragging the small box in the bottom right of Cell A3 down to Cell A32. Note Jan 31 is indicated.



Release the selection there and all days in January will be populated. This works for many different labels, such as days—Sunday in one cell and Monday in the next can be dragged out to complete a week. 10 and 20 in two cells can be dragged out to multiples of 10 (10,20,30,40,etc.). Week 1 and Week 2 in two cells can be dragged out to Week 3 and Week 4 and beyond.

Thirty-one days in January populated in Column A:

	A	B
1	Date	Deliveries
2	1-Jan	
3	2-Jan	
4	3-Jan	
5	4-Jan	
6	5-Jan	
7	6-Jan	
8	7-Jan	
9	8-Jan	
10	9-Jan	
11	10-Jan	
12	11-Jan	
13	12-Jan	
14	13-Jan	
15	14-Jan	
16	15-Jan	
17	16-Jan	
18	17-Jan	
19	18-Jan	
20	19-Jan	
21	20-Jan	
22	21-Jan	
23	22-Jan	
24	23-Jan	
25	24-Jan	
26	25-Jan	
27	26-Jan	
28	27-Jan	
29	28-Jan	
30	29-Jan	
31	30-Jan	
32	31-Jan	

3. Now we need some data. Any random data will do for this exercise.

   In Cell B2 type: **=INT(RAND()*100)**

   Starting from inside the parentheses, the RAND() function creates a random number equal to or greater than 0 and less than 1, and multiplying that number by 100 gives us a number equal to or greater than 0 and less than 100. The INT function at the beginning, gives us an integer (drops off any numbers to the right of the decimal point). Since our data is about number of 'deliveries', we need an integer/whole number, since it's not possible to have half of a delivery. Here's what my data looks like, but as Excel generates random numbers, the chances that two datasets are the same is extremely slim because the RAND() function generates a different set of numbers each time it is used.

	A	B
1	Date	Deliveries
2	1-Jan	61
3	2-Jan	53
4	3-Jan	14
5	4-Jan	70
6	5-Jan	83
7	6-Jan	12
8	7-Jan	83
9	8-Jan	85
10	9-Jan	45
11	10-Jan	96
12	11-Jan	91
13	12-Jan	11
14	13-Jan	88
15	14-Jan	61
16	15-Jan	49
17	16-Jan	36
18	17-Jan	74
19	18-Jan	34
20	19-Jan	53
21	20-Jan	92
22	21-Jan	67
23	22-Jan	73
24	23-Jan	88
25	24-Jan	83
26	25-Jan	2
27	26-Jan	51
28	27-Jan	26
29	28-Jan	11
30	29-Jan	0
31	30-Jan	69
32	31-Jan	23

Now we can begin creating a chart of our data. Let's take a moment to save our workbook as 'deliveries.xlsx'. Note that when you save the file, Excel will regenerate all the random numbers in Column B. In other words, your data will change, but this is ok, because we're merely using the data to practice making charts.

If you'd like to work through the tutorial with the same data, here's the solution:
Select Cells B2:B32.

	Date	Deliveries
2	1-Jan	61
3	2-Jan	53
4	3-Jan	14
5	4-Jan	70
6	5-Jan	83
7	6-Jan	12
8	7-Jan	83
9	8-Jan	85
10	9-Jan	45
11	10-Jan	96
12	11-Jan	91
13	12-Jan	11
14	13-Jan	88
15	14-Jan	61
16	15-Jan	49
17	16-Jan	36
18	17-Jan	74
19	18-Jan	34
20	19-Jan	53
21	20-Jan	92
22	21-Jan	67
23	22-Jan	73
24	23-Jan	88
25	24-Jan	83
26	25-Jan	2
27	26-Jan	51
28	27-Jan	26
29	28-Jan	11
30	29-Jan	0
31	30-Jan	69
32	31-Jan	23

Then either right click and choose ‘Copy’ or press CTRL-C on your keyboard. Leave the data selected and right click and choose Paste Special and in the Paste Special dialog box, choose ‘Values’ and then click OK.

	Date	Deliveries
2	1-Jan	61
3	2-Jan	53
4	3-Jan	14
5	4-Jan	70
6	5-Jan	83
7	6-Jan	12
8	7-Jan	83
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13	12-Jan	11
14	13-Jan	88
15	14-Jan	61
16	15-Jan	49
17	16-Jan	36
18	17-Jan	74
19	18-Jan	34
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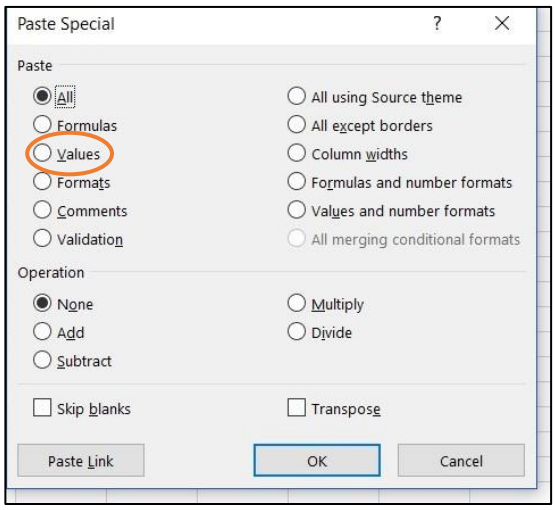
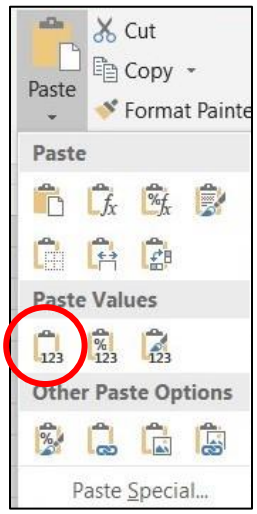
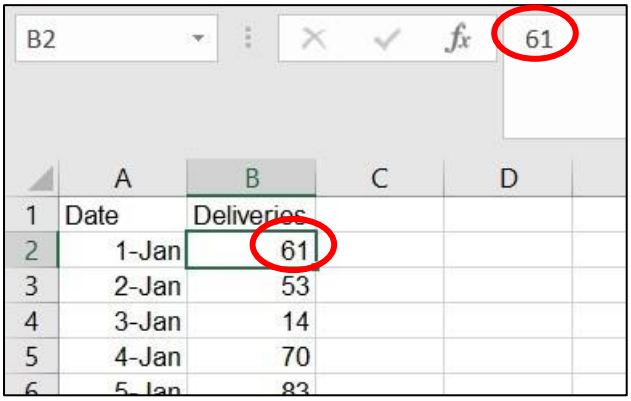


Depending upon your version of Excel, you may also be able to accomplish this same task by doing the copy as described, then clicking on Home, selecting Paste/Paste Special, and select the first option in the Paste Values list.



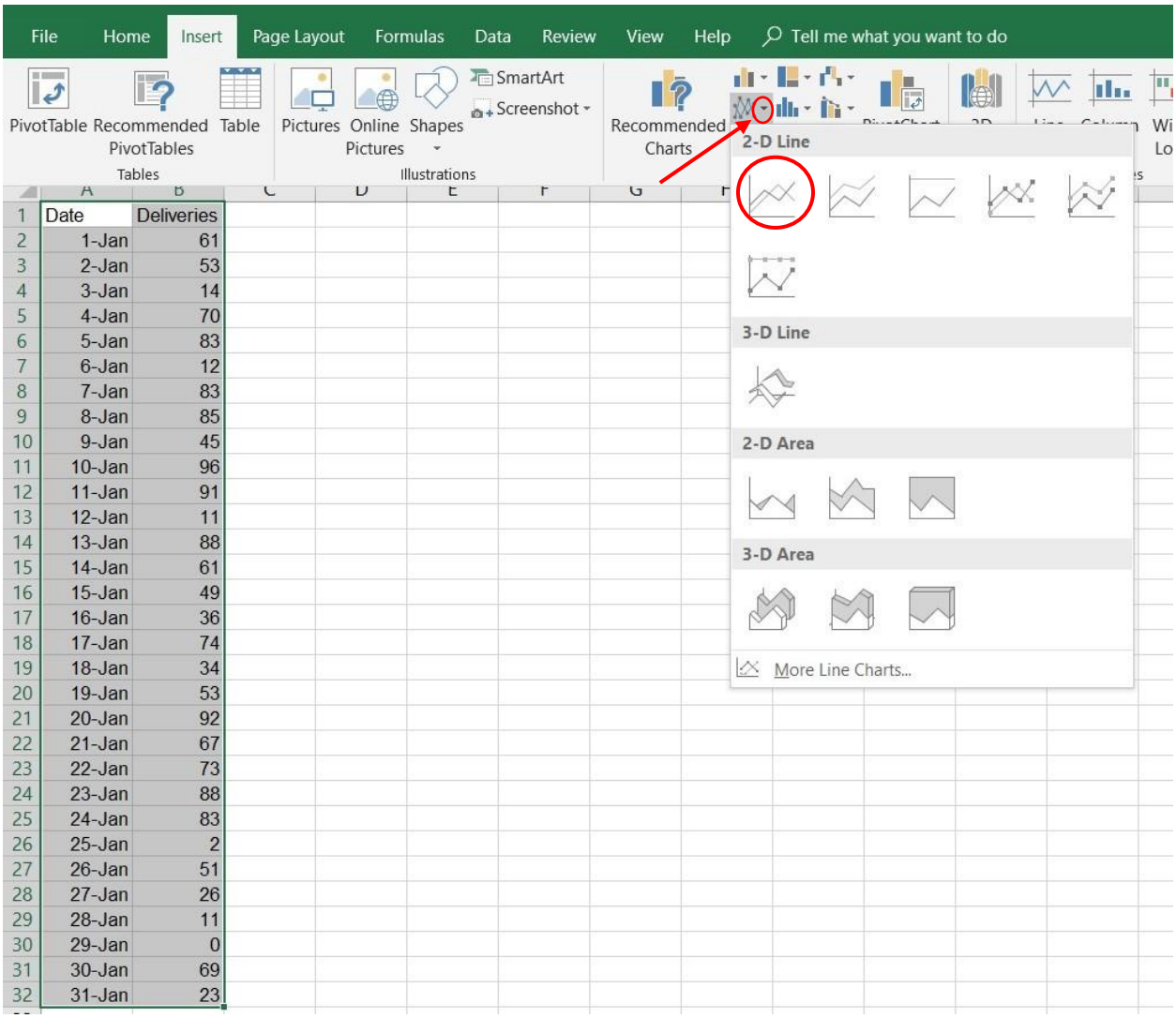
If you were to merely 'paste' the contents of the cells (using CTRL-V, for example), you would paste the RAND() formula we created and this would regenerate random numbers again. After the 'Paste Special' operation, if you look in any cell and in the formula bar, you'll see only a number not the RAND() formula.



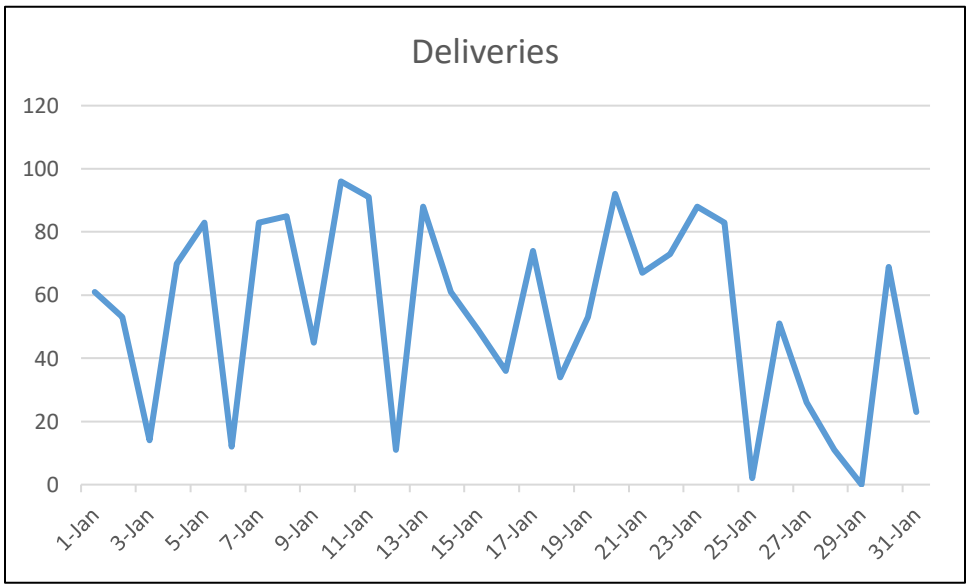
4. There are MANY ways to create charts in Excel. What I'm about to show you is only one way. If you have a preferred approach, by all means, use that approach. It's the end result that is important, rather than which icons you click to get there.

   First, let's try selecting both columns, including the labels, so A1:B32 and clicking on chart.

   From the Insert Tab, click on the down arrow next to 2-D Line chart and choose the most basic chart.

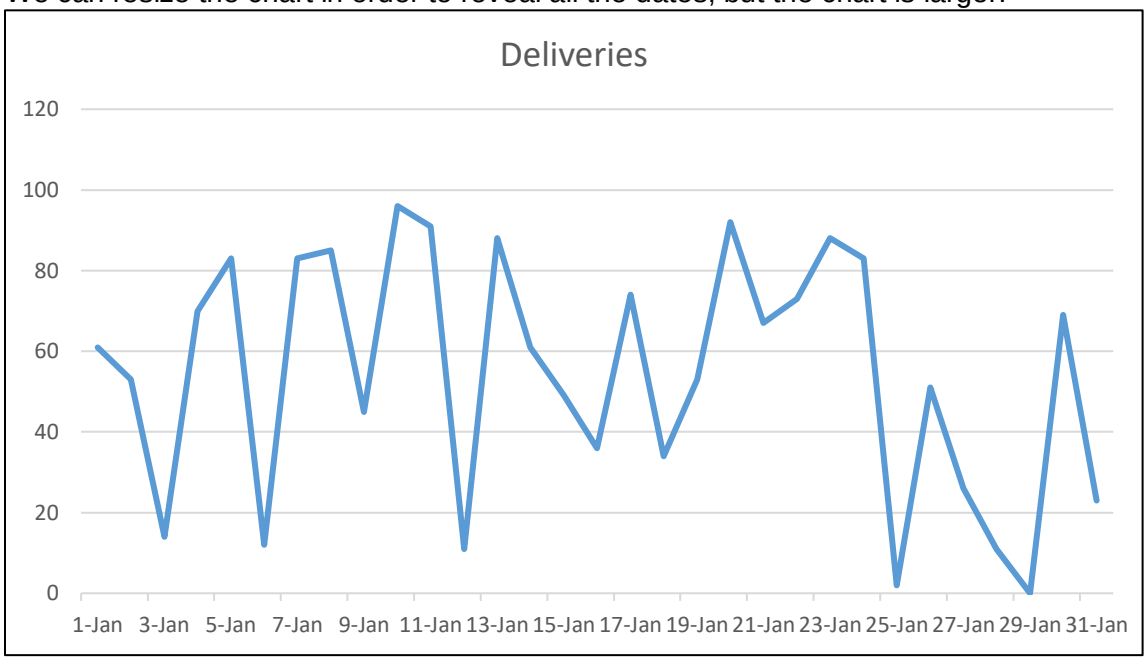


Here is the result. Again, your result may NOT look like this:



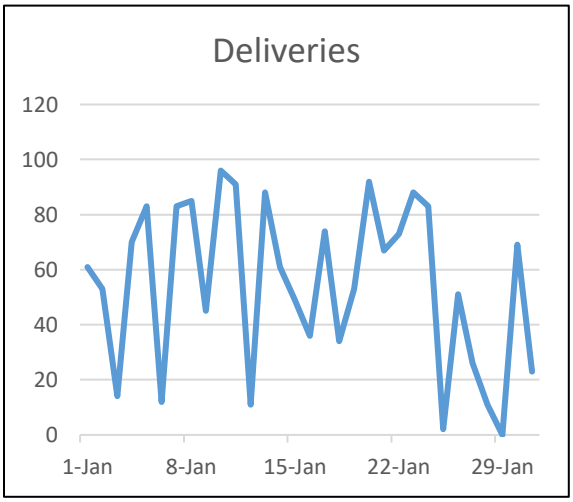
5. Excel tries to make 'educated' guesses at what the labels are and what the data might be. So the label in Cell B1 becomes the title of the chart. The dates are on the X-axis and the values are on the Y-axis. Excel has done a good job at interpreting our data, but this is not always the case, particularly as data becomes more complex. Once again this is the role of the data analyst to correct any mistakes in visualization or presentation that Excel might make. Note that with the default size of the chart, the X-axis for dates is showing only every other day, although the chart line does show every day.

   We can resize the chart in order to reveal all the dates, but the chart is larger.



   Note the overall shape of the chart remains the same, even if I reduce the size and even fewer dates appear on the X-axis.

   Here we're showing only every 7 days:



6. In this tutorial, we examined only ONE type of chart and with one single variable. I strongly encourage you to experiment with other types of charts and other data sets.