

How To Create a Line Graph in Numbers

Let's imagine that after we've created a Cumulative Distribution Table for the data we collected on the number of hours of sleep college students get each night, we want to create a Line Graph to visually represent our data.

First, we will create our Line Graph Bins. A Line Graph Bin is an interval that is entered into only one cell of our spreadsheet. For example, when we created our Absolute Frequency Table, we entered the minimum and maximum of each interval into two separate columns (Min and Max). Now, we want our interval to be together in one cell, under one Column Heading.

To create our Line Graph Bins, we start by entering the Column Header "Line Graph Bins" into a blank column in our spreadsheet. In the first cell of this column we enter our first bin value (our first interval). In this example our first bin value is 1 to 3. We then continue to enter the rest of our intervals into the Line Graph Bins column.


Second, in the column to the right of the Line Graph Bins column, we enter the Column Header "Absolute Frequency." In this column, we enter our Absolute Frequency values from Column E for each interval. In this example, they are 1, 8, and 9.

Line Graph Bins	Absolute Frequency	Cumulative Absolute Frequency
1 to 3	1	1
4 to 6	8	9
7 to 9	9	18


Third, to the right of the Absolute Frequency column, we enter the Column Header "Cumulative Absolute Frequency." In this column, we enter our Cumulative Absolute Frequency values from Column G for each interval. In this example, they are 1, 9, and 18.

Once we've created our three new columns for our Line Graph Bins, our Absolute Frequency, and our Cumulative Absolute Frequency we are ready to begin making our Line Graph.


Min	Max	Absolute Frequency	Relative Frequency	Cumulative Absolute Frequency	Cumulative Relative Frequency	Line Graph Bins	Absolute Frequency	Cumulative Absolute Frequency
1	3	1	0.056	1	0.056	1 to 3	1	1
4	6	8	0.444	9	0.500	4 to 6	8	9
7	9	9	0.500	18	1.000	7 to 9	9	18
Total			18	1.000				



1



2



3

To create a Line Graph, we begin by selecting the data and column heading for our new “Absolute Frequency” column, and our data and column heading for our new “Cumulative Absolute Frequency” column. These data are outlined in blue in the figure above. We want to be sure to select **both** the data and the Column Headings.

First, click “Chart” in the ribbon at the top center of the Apple Numbers window.

Second, click “2D.”

Third, select the line graph icon.

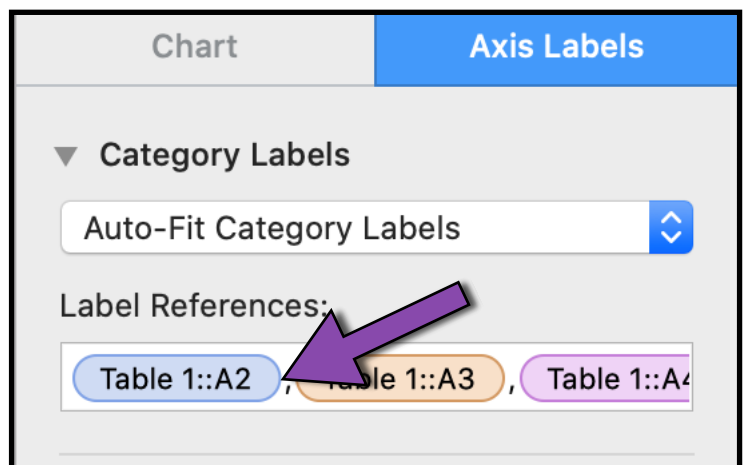
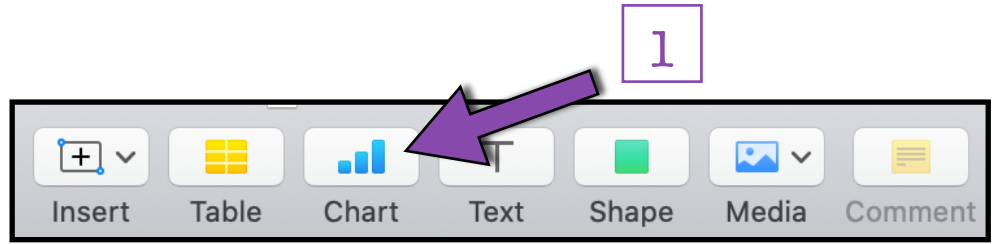
Clicking on that option will cause a Line Graph to appear!

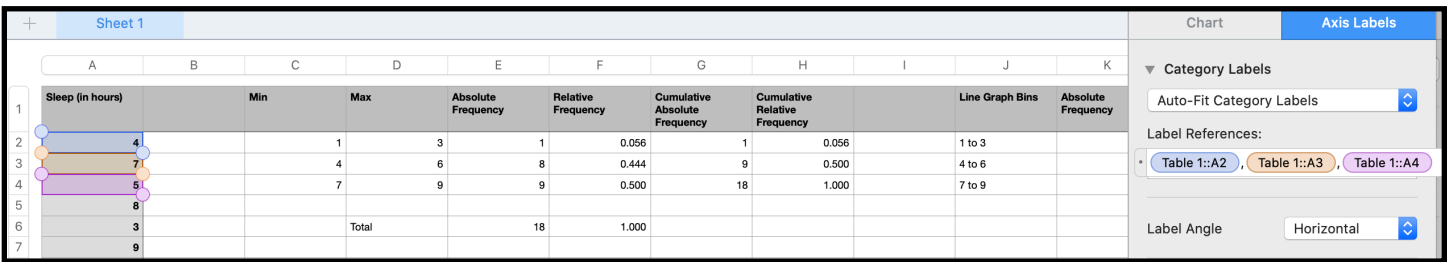
However, the Line Graph that appears does not have the correct Graph Units on its x-axis (the units of information presented on the x-axis). We want our x-axis Graph Units to be the Line Graph Bins we created.

To tell Numbers what we want our x-axis Graph Units to be, first, we double click on the x-axis Graph Units.

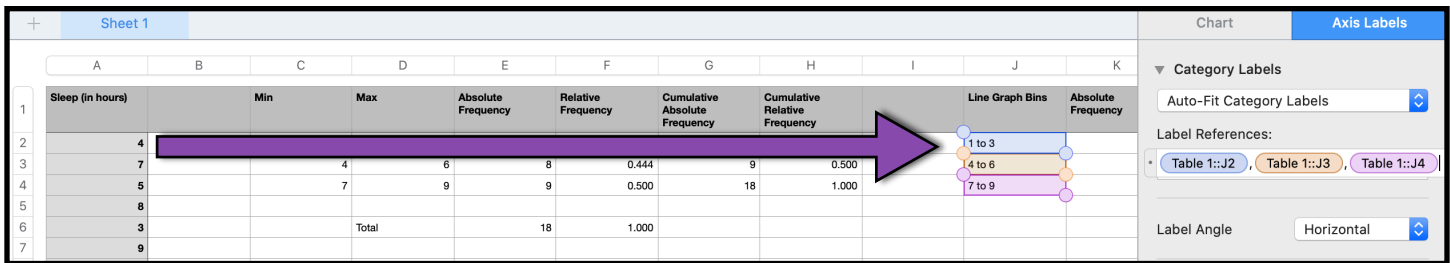
Double clicking on the x-axis Graph Units will open the “Axis Labels” toolbar on the right side of the screen.

Next, we must click on the data shown under “Label References.”





As shown above, rather than looking under the Column Header “Line Graph Bins” for our x-axis units, Numbers is looking under the “Sleep (in hours)” Column Heading.



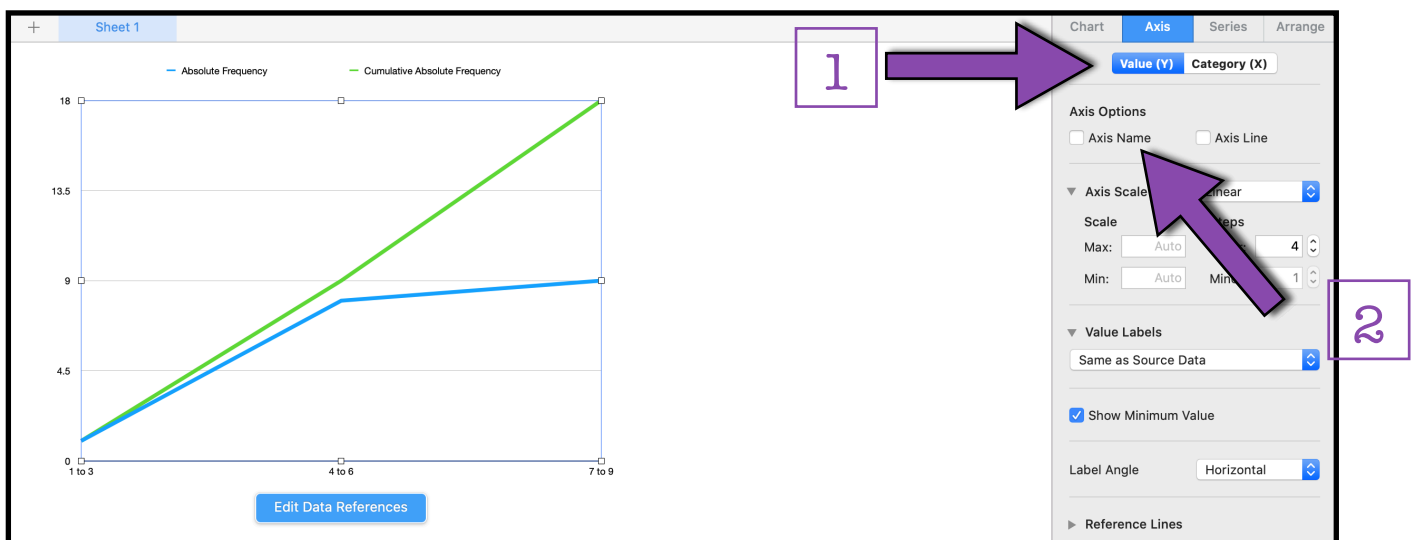
To tell Numbers to look under the Column Header “Line Graph Bins,” we simply click on each colored box individually and while holding down our cursor, drag them straight across the row they appear in until they are under the “Line Graph Bins” Column Header.

Now that our x-axis Graph Units are correct, we need to check to see if our Line Graph contains all of the major components of a graph.

This Line Graph is missing some major components. Therefore, we need to add a few more things to our Line Graph before it is complete. One of the missing components in this graph is its Axis Labels.

To add Axis Labels, we select our graph by clicking anywhere on the graph. From the right side Format toolbar we first select “Axis”, then second “Value (Y).”

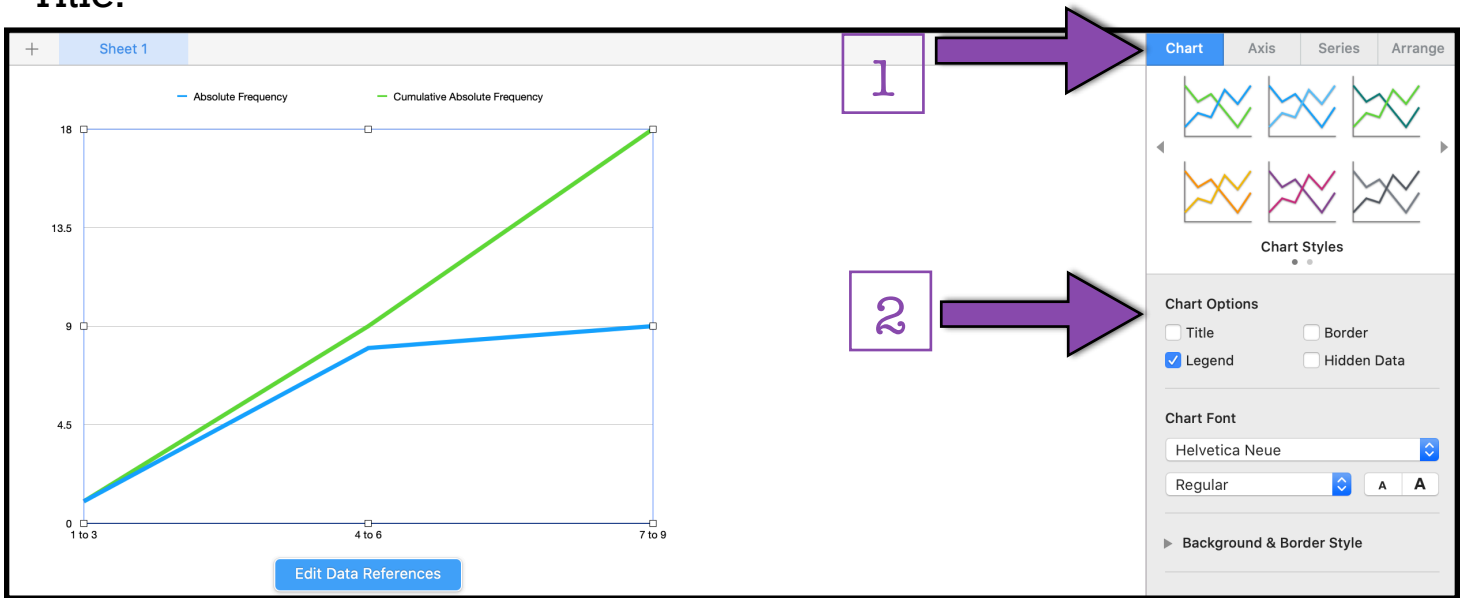
From the Value (Y) menu we check the box next to “Axis Name,” which will add a placeholder vertical axis (y-axis) label to our Line Graph. In Numbers, this placeholder axis label is called “Value Axis.”



After adding the placeholder for our vertical axis label, we need to select “Category (X),” to add a placeholder for our horizontal axis (x-axis). Under Category (X) we check the box next to “Axis Name” to add our placeholder horizontal axis (x-axis) label.

Our Line Graph is also missing a Graph Title. To add a placeholder graph title, select the graph by clicking anywhere in the graph.

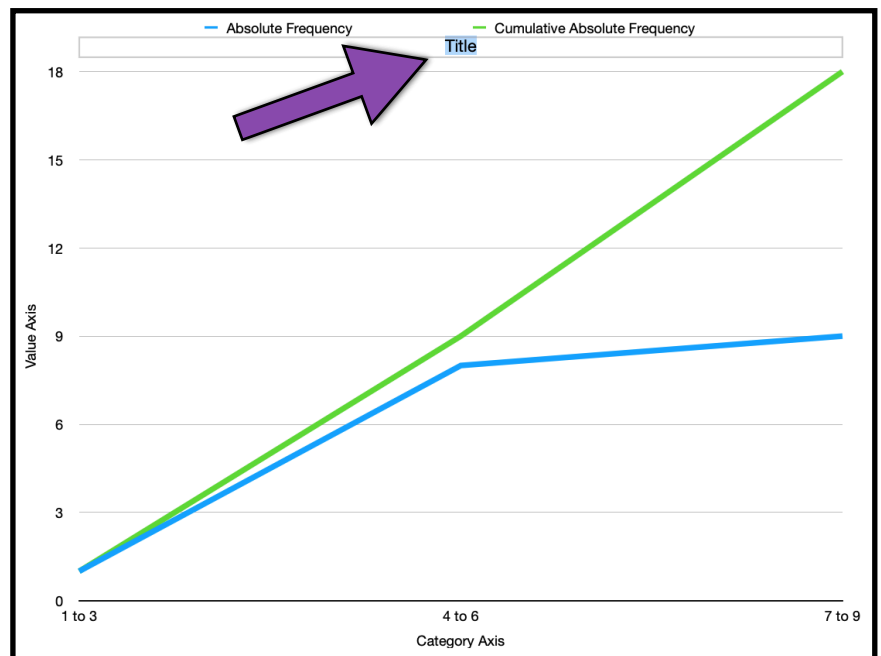
The Format toolbar will appear on the right side of the screen. From there, first select “Chart.” Second under “Chart Options” check the box next to “Title.”



Now we need to make our placeholder axis labels and graph title more informative. “Value Axis,” “Category Axis,” and “Title” don’t give us enough information!

To change the text of our Graph Title and our Axis Labels, we can simply double-click on the text of the label, highlight the existing text, and replace the existing text with our new label.

Once we’ve added our informative Graph Title and Axis Labels, we need to look at the Graph Units (the units of information presented on our axes).



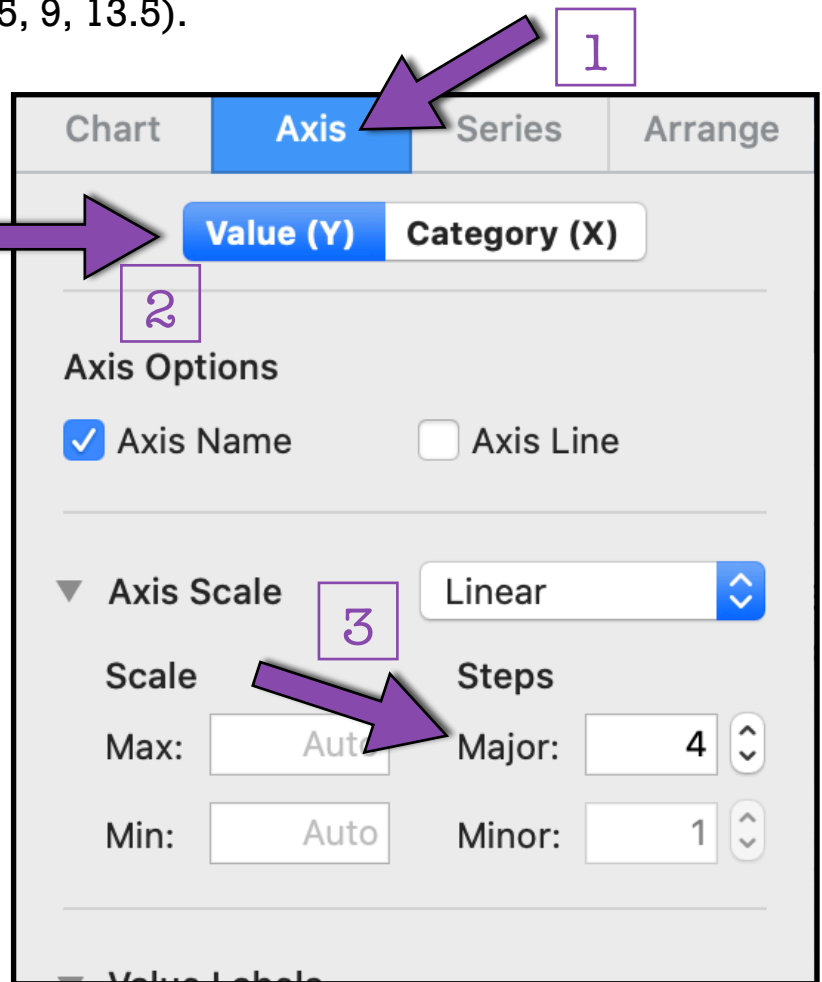
For our hours of sleep data, Numbers has automatically created our Graph Units in increments of 4.5 (e.g., 4.5, 9, 13.5).

However, because our Absolute Frequency is measured in whole numbers, we want to change our y-axis Graph Units to also be only whole numbers.

To change the y-axis Graph Units, we first click anywhere on the graph to select it. A “Format” toolbar will open on the right side of the window.

From the Format tool bar, we first select “Axis,” and second select “Value (Y).”

Here, under “Axis Scale” menu we change the the increments for the y-axis by increasing or decreasing the Major “Steps.”



In this case, we want Major Steps to increase in whole numbers, so we will change our Major Steps to be 6.

We chose 6 because 6 Major Steps makes our y-axis steps into increments of 3, which gives us whole numbers for our y-axis Graph Units.

Finally, we may want to adjust the color or dash type of the lines in our Line Graph.

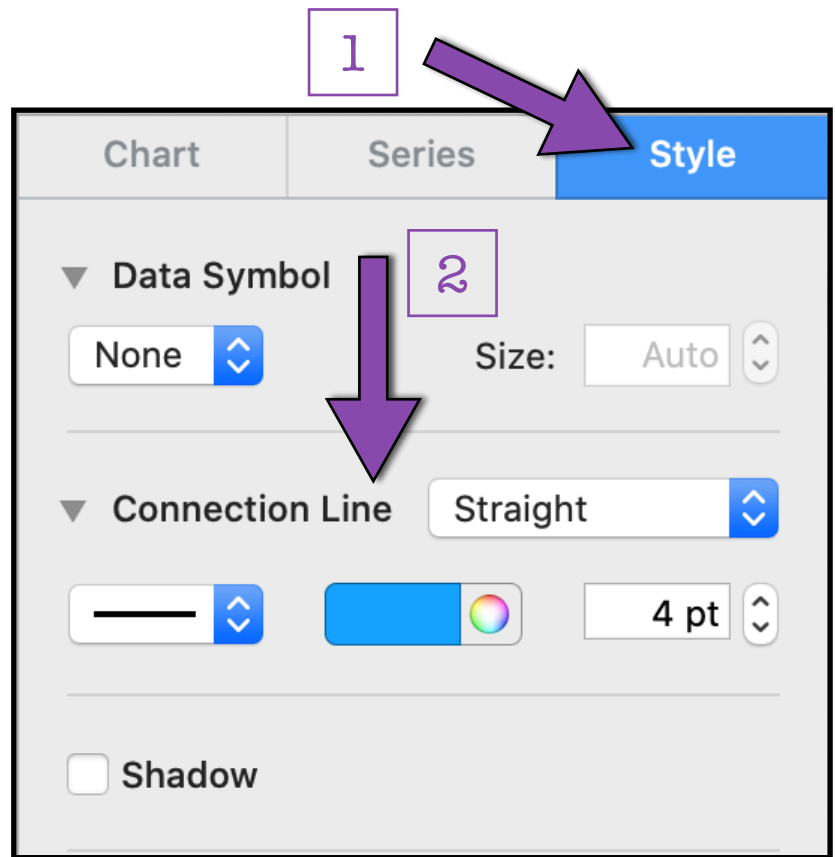
To change the color or dash type of our lines, we first select a line by clicking once on either of the lines.

A new Format toolbar will open on the right side of the screen.

From the new Format menu, we first select “Style.”

Second, under the “Connection Line” dropdown menu we can select the color or dash type we would like to use for our line.

There are endless options for customizing the color and dash type! However, we must be sure to keep the principles of designing good graphs in mind when choosing our color or dash type.



We've now created a Line Graph using Apple Numbers!