

# How To Create a Histogram in Numbers

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

First, we will create our Histogram Bins. A Histogram 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 Histogram Bins, we start by entering the Column Header "Histogram 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 Histogram Bins column.

Histogram Bins	Absolute Frequency
1 to 3	1
4 to 6	8
7 to 9	9

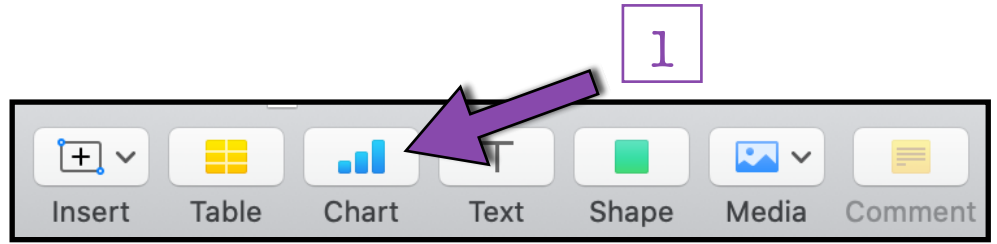
Second, in the column to the right of Histogram Bins, we enter the Column Header "Absolute Frequency." In this column, we enter our Absolute Frequency values from Column E for each interval. In this example, they are 1, 8, and 9.

Once we've created our two new columns for our Histogram Bins and our Absolute Frequency, we are ready to begin making our Histogram.

To create a Histogram, we begin by selecting the data in our "Absolute Frequency" column. These data are outlined in blue in the figure below. We want to be sure to select only the data, not the Column Heading.

Sleep (in hours)	Min	Max	Absolute Frequency	Relative Frequency	Cumulative Absolute Frequency	Cumulative Relative Frequency	Histogram Bins	Absolute Frequency
4	1	3	1	0.056	1	0.056	1 to 3	1
7	4	6	8	0.444	9	0.500	4 to 6	8
5	7	9	9	0.500	18	1.000	7 to 9	9
3		Total	18	1.000				

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



Second, from the Chart drop down menu under “2D” select the first chart icon.

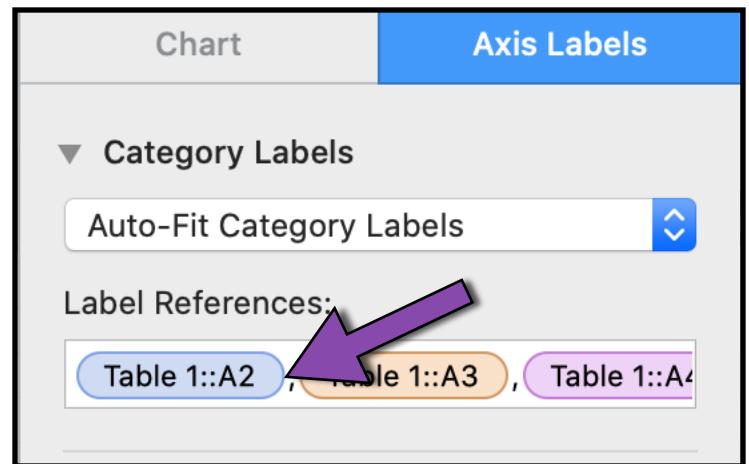


Clicking on that option will cause a Histogram to appear!

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

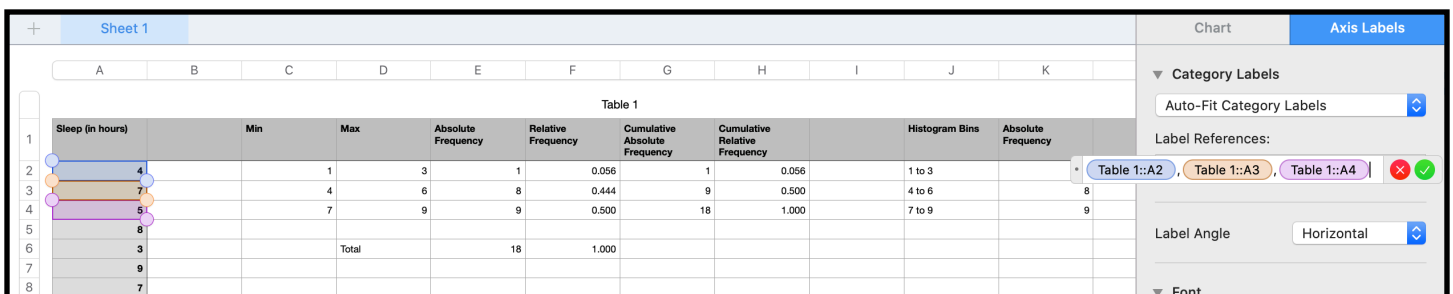
To tell Numbers what we want our x-axis Graph Units to be, first, we double click on the x-axis Graph Units.

Double clicking will open the “Axis Labels” toolbar on the right side of the screen.

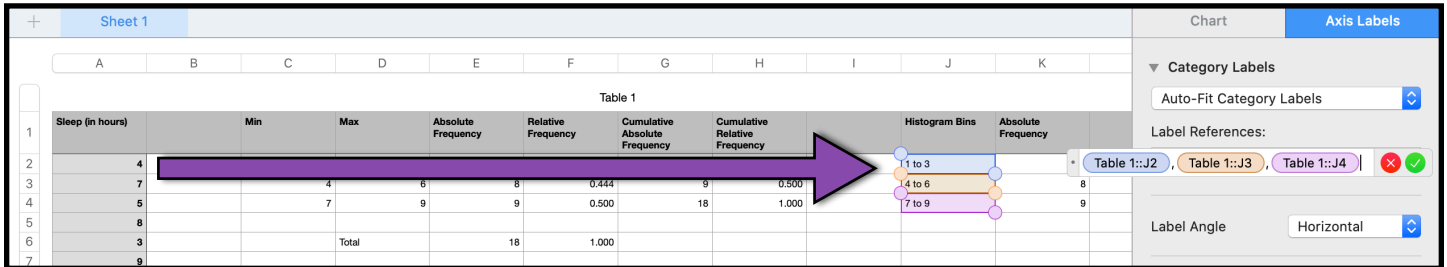


Next, we must click on the data shown under “Label References.”

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



To tell Numbers to look under the Column Header “Histogram 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 “Histogram Bins” Column Header.



Now that our x-axis Graph Units are correct, we need to check to see if our Histogram contains all of the major components of a graph. This Histogram is missing some major components. Therefore, we need to add a few more things to our Histogram 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 “Value (Y).”

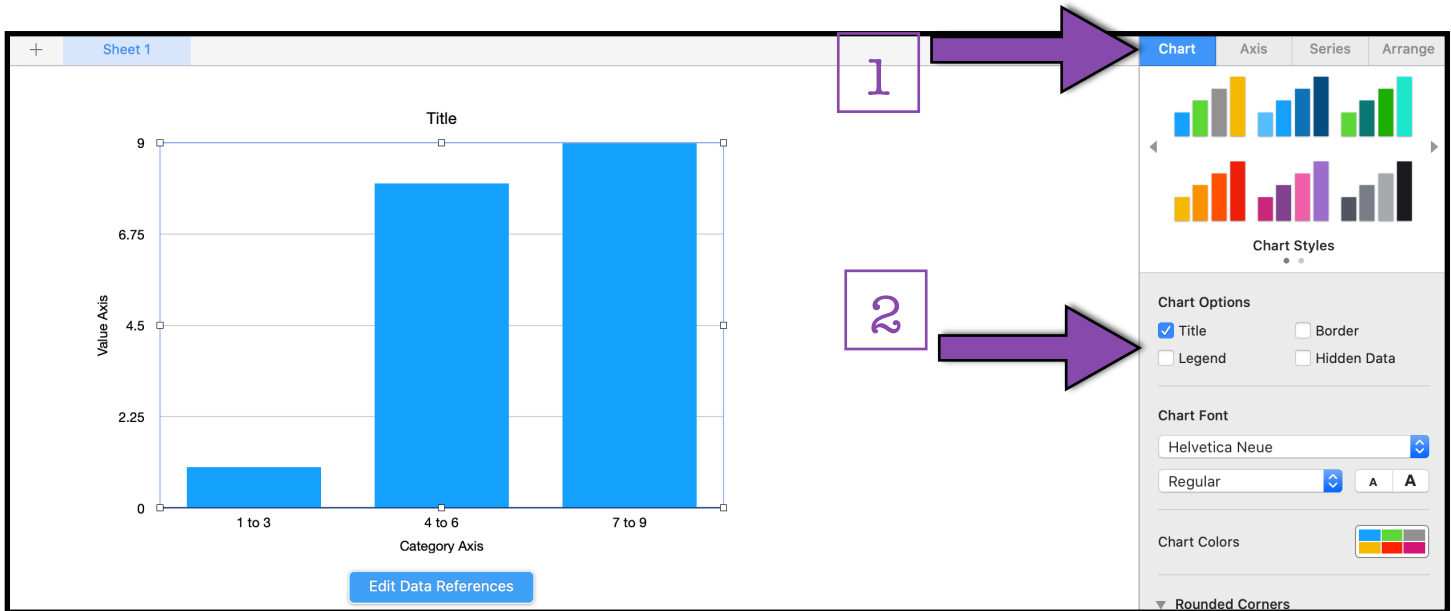
From the Value (Y) menu we check the box next to “Axis Name,” which will add a placeholder vertical axis (y-axis) label to our Histogram. In Numbers, this placeholder axis label is called “Value Axis.”



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

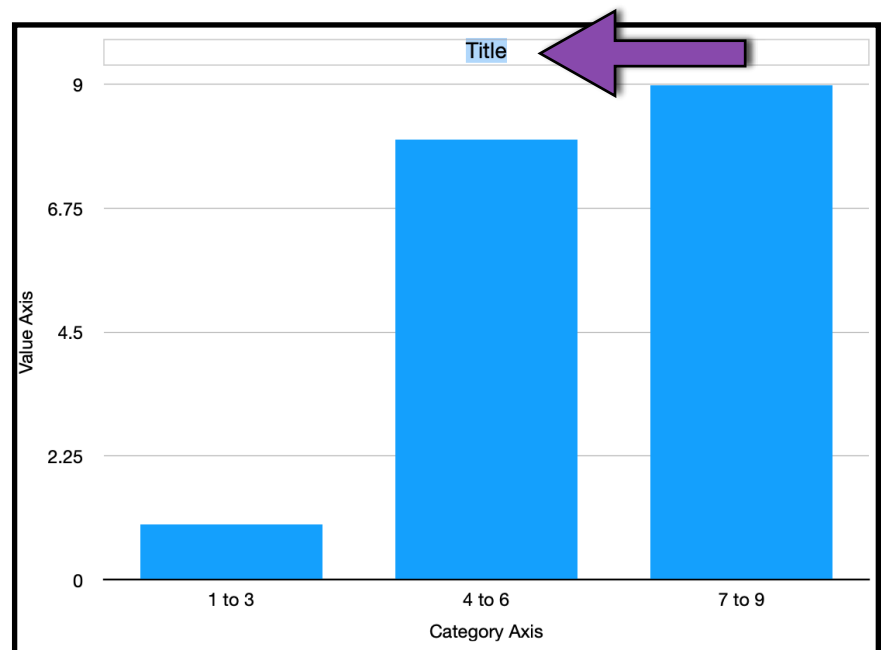
The Format toolbar will appear on the right side of the screen. From there, first select “Chart.” Second under “Chart Options” check the box next to “Title.”



Since our graph includes only one type of data, we will also uncheck the box “Legend” to remove the graph legend.

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).

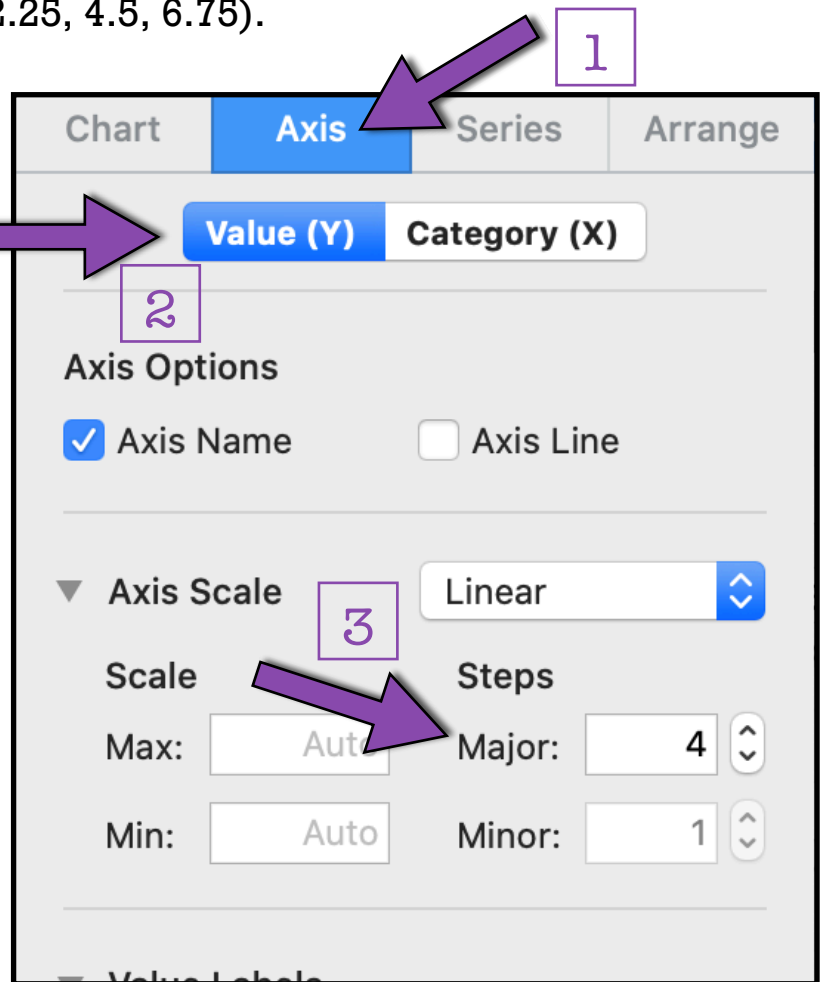
For our hours of sleep data, Numbers has automatically created our Graph Units in increments of 2.25 (e.g., 2.25, 4.5, 6.75).

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).”

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



In this case, we want Major Steps to be in increments of 1, so we will change our Major Steps to be 9. We chose 9 because 9 is the highest Absolute Frequency Value in our Absolute Frequency Table, so we will have 1 Major Step increase for every value.

Finally, we may want to adjust the color or pattern of the data bars in our Histogram.

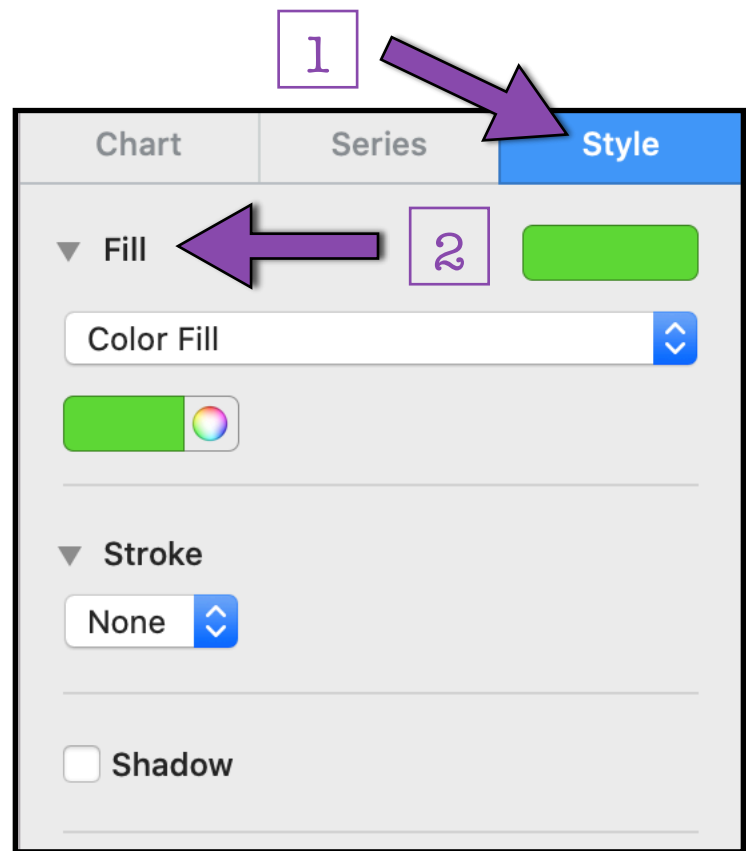
To change the color or pattern of our data bars, we first select the data bars by clicking once on any of the bars.

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

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

Second, under the “Fill” dropdown menu we can select the color or pattern we would like to use to fill our bars.

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



We've now created a Histogram using Apple Numbers!