

# Sports Economics Tableau Guide

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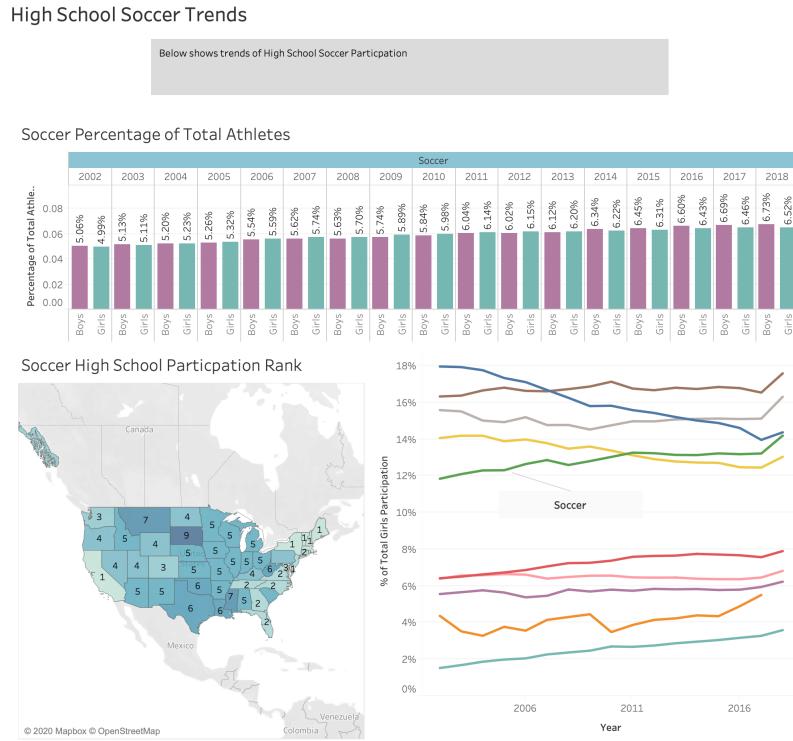
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# 1 Creating your first Dashboard

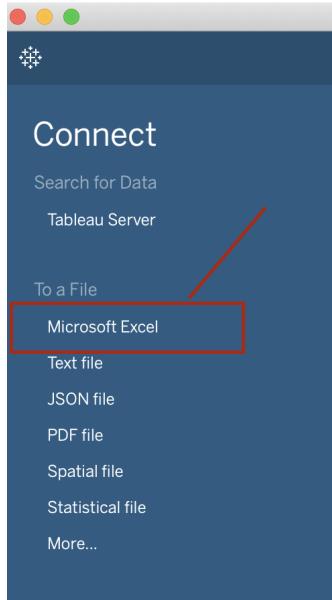
In this section we are going to go step by step through making a dashboard. The data we are going to be using can be found [here](#). The data is high school sport participation in the United States since 2002. A [538 article](#) about the rise of soccer in the United States inspired this dashboard. If you are interested check out the article for more details. The article looks at the rising trends of soccer of high school students in the United States and attributes this trend as part of the reason US Women's soccer performs quite well. We are going to examine some of these trends in this tutorial. By the end, we are going to make a dashboard that looks something like this:



## 1.1 Importing the Data

To get start we need to import the [data](#). Tableau has the ability to work with many data sources, whether from a file or a server. In this example we are need to upload the the excel file from the NFHS website in the link. **It is important to select the correct file type, otherwise Tableau may give you an error.** To do so:

1. Click on "Microsoft Excel" under Connect -> To a File



2. Select the data file from your computer
3. Then you should see the following screen

Year	State	Sport	Participation Data	Boys School	Girls School	Participation Data	Boys Participation	Girls Participation
2018/2019	AL	Adapted Basketball		0	0	0	0	0
2018/2019	AL	Adapted Bocce - Indoor		0	0	0	0	0
2018/2019	AL	Adapted Bowling		0	0	0	0	0
2018/2019	AL	Adapted Floor Hockey		0	0	0	0	0
2018/2019	AL	Adapted Soccer		0	0	0	0	0
2018/2019	AL	Adapted Softball		0	0	0	0	0
2018/2019	AL	Adapted Track		0	0	0	0	0
2018/2019	AL	Adapted Volleyball		0	0	0	0	0
2018/2019	AL	Adaptive Corn Toss		0	0	0	0	0
2018/2019	AL	Adaptive Golf		0	0	0	0	0
2018/2019	AL	Adaptive Handball		0	0	0	0	0
2018/2019	AL	Adaptive Strength Tr...		0	0	0	0	0
2018/2019	AL	Adaptive Tennis		0	0	0	0	0
2018/2019	AL	Air Riflery		0	0	0	0	0
2018/2019	AL	Archery		0	0	0	0	0
2018/2019	AL	Badminton		0	0	0	0	0

If your screen looks something like the image above then you have successfully imported the data. Once again, Tableau requires you tell it exactly the type of data file you import, so if you had issues make sure you selected Excel.

## 1.2 Editing the data in place

Tableau has a lot of different features of doing various operations to the data. Sometimes you will do this to clean the data, other time you will do this to put the data into another format. Tableau reads data in several different data types. As you can see in the image below these are : **Number (Decimal)**, **Number (Integer)** , **Date & Time**, **Date** , **String**, **Boolean**, and **geographic**. . By clicking on the "ABC" symbol above year you can see the different options. Above each of the variables, we can see its data type. For example, year is a string <sup>1</sup>, State is a geographic variable , and Boys School is a number.

The screenshot shows the Tableau Data Editor interface. At the top, there are buttons for 'Sort fields' and 'Data source order'. Below this is a table with columns for 'Sport', 'Boys School', and 'Girls School'. The 'Sport' column lists various adapted sports. The 'Boys School' and 'Girls School' columns show counts of participation, both of which are 0 for all listed sports. On the left side of the table, there is a sidebar with a tree view of data types. The 'Sport' field is currently selected, showing it is a 'String' type. Other items in the tree include 'Number (decimal)', 'Number (whole)', 'Date & Time', 'Date', 'Boolean', 'Default', and 'Geographic Role'. The 'Geographic Role' item has a dropdown arrow next to it, indicating it can be expanded.

Sport	Boys School	Girls School
Adapted Basketball	0	0
Adapted Bocce - Indoor	0	0
Adapted Bowling	0	0
Adapted Floor Hockey	0	0
Adapted Soccer	0	0
Adapted Softball	0	0
Adapted Track	0	0
Adapted Volleyball	0	0
Adaptive Corn Toss	0	0
Adaptive Golf	0	0
Adaptive Handball	0	0

When Tableau reads in the data, it tries its best to guess what our data is. Sometimes the data will be read in as a type we did not want. This becomes important when we make our visualizations. **Tableau uses the data type to decide which type of visualizations are appropriate.**

In our case we want to make sure Year is a date variable instead of a string. In order to make the year into something Tableau will recognize as a date, we first need to separate the data. To do this Tableau has the operation **Split**. By default when using split, Tableau guesses how to split the data, otherwise you can use **Custom Split** to tell the program how to do it.

For our situation the split command is good enough. What we will need to do is

1. Right click on Year and click split.

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<sup>1</sup>This is computer talk for when the data is just text

The screenshot shows the Tableau Data Source view. A context menu is open over the 'Year' field in the 'Participation Data' sheet. The menu options include 'Rename', 'Copy Values', 'Hide', 'Aliases...', 'Create Calculated Field...', 'Create Group...', 'Split', 'Custom Split...', 'Pivot (select multiple fields)', and 'Describe...'. The 'Year' field is currently set to '2018/2019'.

2. Rename Year Split 1 and Split 2 by right clicking and clicking rename. I chose to rename them "Start of School Year" and "End of School Year".
3. Now we need to tell Tableau these are dates. Click on the number symbol for each of the new variables and select date.

The screenshot shows the Tableau Data Source view. A context menu is open over the 'Year' field in the 'Participation Data' sheet. The 'Number (decimal)' option is selected. Other options in the menu include 'Number (whole)', 'Date & Time', 'Date', and 'String'. The 'Year' field is currently set to '2018/2019'.

4. Afterwards Tableau should automatically reformat the data to look like a date, like below.

Now we are ready to create our first worksheet!

### 1.3 Your First Worksheet: Preparing the Data

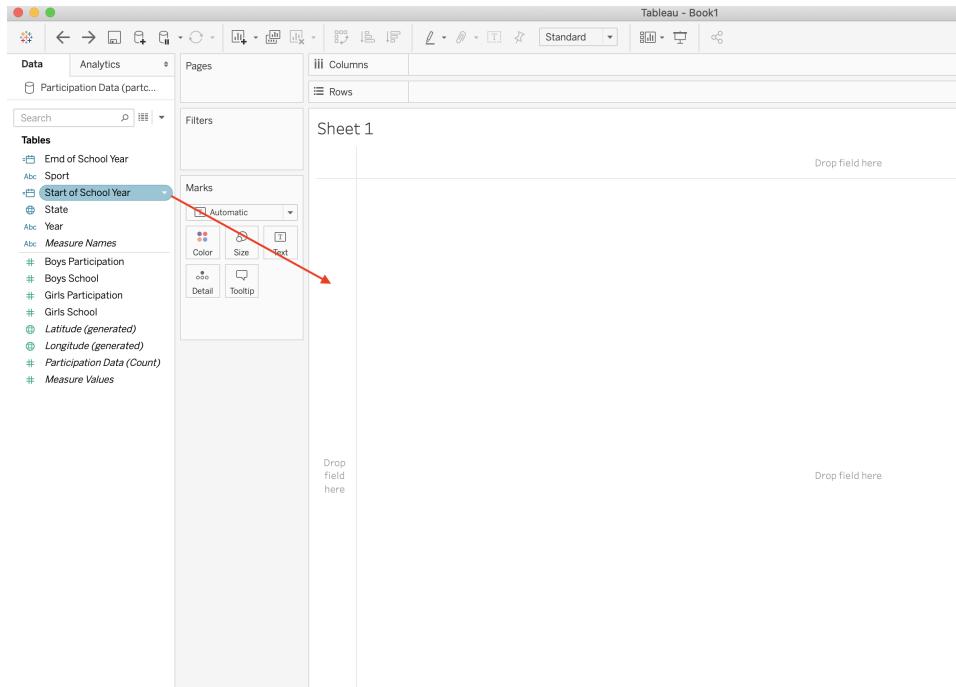
Now that we have the data imported and turned the year into a date variable, we can start to create the first figure. The first step is to open a new worksheet. Click on the bottom left of the screen on "Sheet 1" if it's already there. If not, in the corner you should be able to click on the bottom right next to it in the figure below called "New Worksheet".

New Worksheet

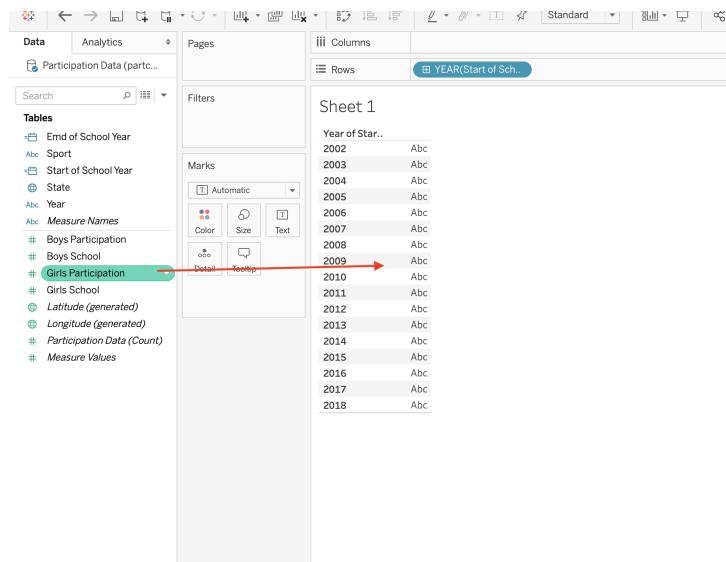
Abc Participation Da... Year	Calculation Start of School Year	Calculation End of School Year	Participation Data State	Abc Participation Data Sport
2018/2019	1/1/2018	1/1/2019	AL	Adapted Basketball
2018/2019	1/1/2018	1/1/2019	AL	Adapted Bocce - In
2018/2019	1/1/2018	1/1/2019	AL	Adapted Bowling
2018/2019	1/1/2018	1/1/2019	AL	Adapted Floor Hock
2018/2019	1/1/2018	1/1/2019	AL	Adapted Soccer
2018/2019	1/1/2018	1/1/2019	AL	Adapted Softball
2018/2019	1/1/2018	1/1/2019	AL	Adapted Track
2018/2019	1/1/2018	1/1/2019	AL	Adapted Volleyball
2018/2019	1/1/2018	1/1/2019	AL	Adaptive Corn Toss
2018/2019	1/1/2018	1/1/2019	AL	Adaptive Golf
2018/2019	1/1/2018	1/1/2019	AL	Adaptive Handball
2018/2019	1/1/2018	1/1/2019	AL	Adaptive Strength
2018/2019	1/1/2018	1/1/2019	AL	Adaptive Tennis
2018/2019	1/1/2018	1/1/2019	AL	Air Riflery
2018/2019	1/1/2018	1/1/2019	AL	Archery
2018/2019	1/1/2018	1/1/2019	AL	Badminton

Now we should have a blank worksheet on the screen. From here, starting to create a figure is as easy as drag and drop. In this section we will create a multiple line chart that compares girls' soccer relative rank to girls' other sports over time.

1. Because we want to show this graph over time, the first thing we need to do is drag "Start of School Year" over into "Drop Field Here" for the rows.

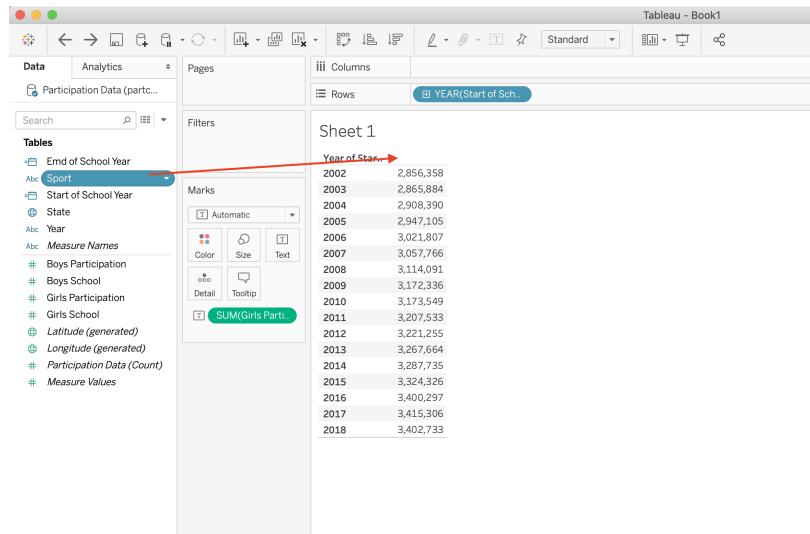


2. This will populate rows of years from 2002 to 2018. The next step will be to include the other variable interest, "Girls Participation". This will be our data for this figure. Drag "Girls Participation" over next to year

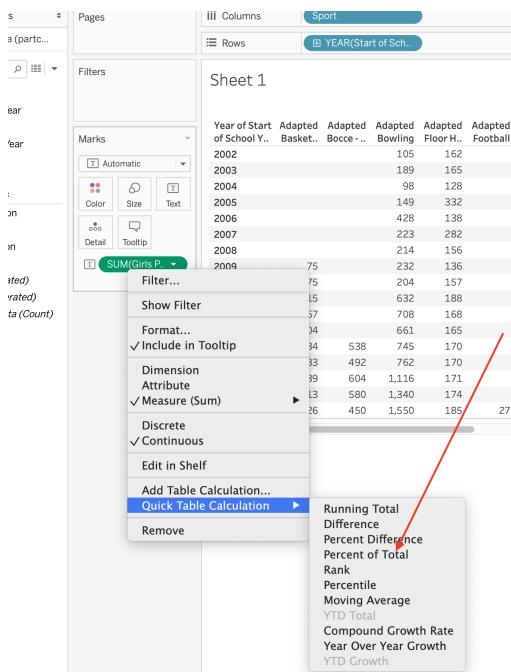


Now that we have some data, let's do two more steps before generating the figure. The goal of this figure is to show the relative rank of each sport. Right now the data is in total numbers in the United States for a given year. We need to add two more components: the sport and their relative rank. Instead let's show this as a percentage of the total for each sport. First let's add the sports:

3. Drag "Sport" to the Columns



- Right click on **Sum(Girls Participation)** under "Marks"



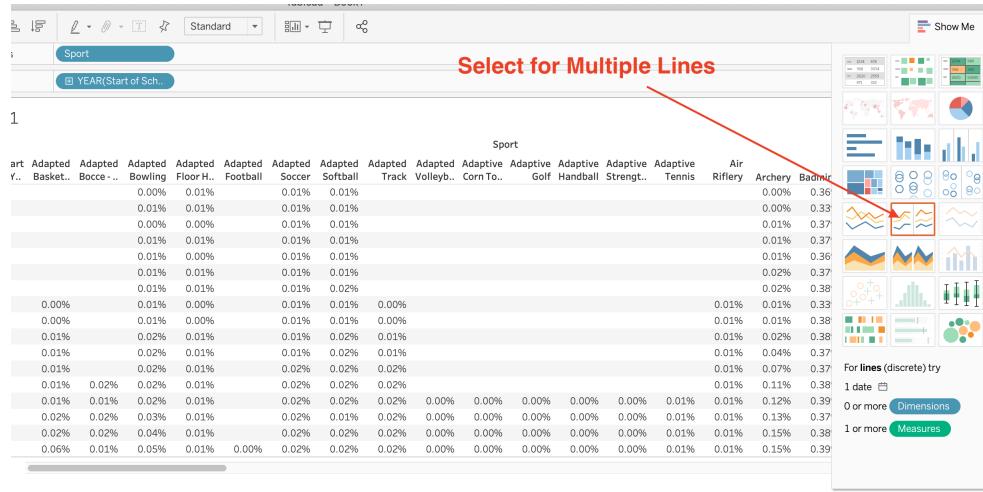
- Then select Quick Calculation -> Percent of Total You'll now see that each number is a percentage. There are two ways to calculate this percent of total, either by year or by sport. Because we are interested in the relative rank by year, we want to make sure the percentages are measured as the percent of total that each sport makes up for a given year. So we need to right click on **Sum(Girls Participation)**.

- This time we will click : Compute using -> Table Across.

Now we are ready to make the figure.

## 1.4 Using Show me: The First Figure

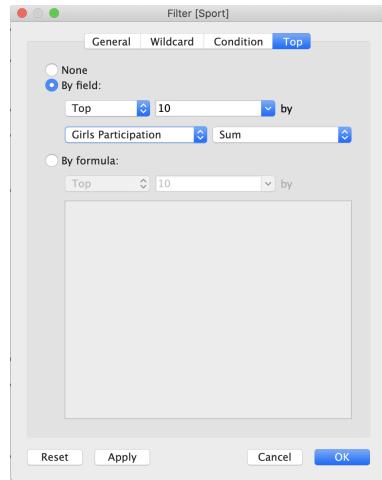
Now that we have the data in order we are going to use the show me feature to make our first figure. On the top right hand-side of the screen, the button "Show me" will suggest different types of Figures that are appropriate for our data. We want to select a multiple line graph, but it will give us many different options.



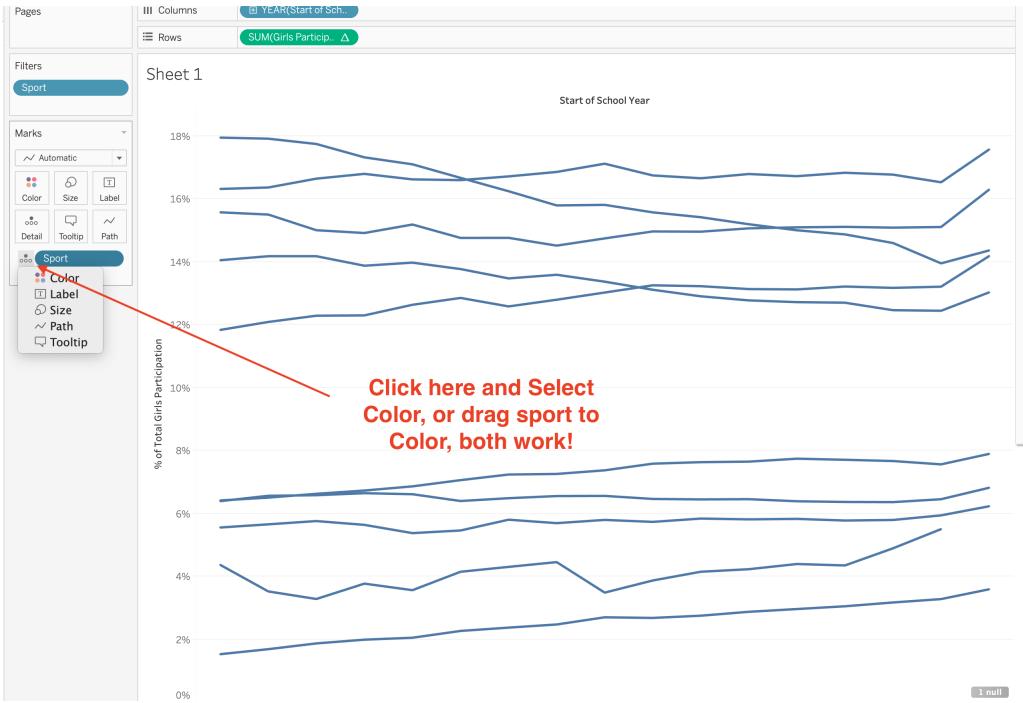
Voila! Tableau has generated our first figure. Now there is still room to make this figure more presentable and readable. Currently the graph is too noisy and hard to read. The first change we are going to make is to filter only the top 10 sports. Then, we will want to make sure soccer is clearly labeled, since it is the theme of our project.

In order to show only the top 10 sports with the highest participation by percentage of total, we are going to make use of Tableau's **Filter** feature. To filter the data we will follow these steps:

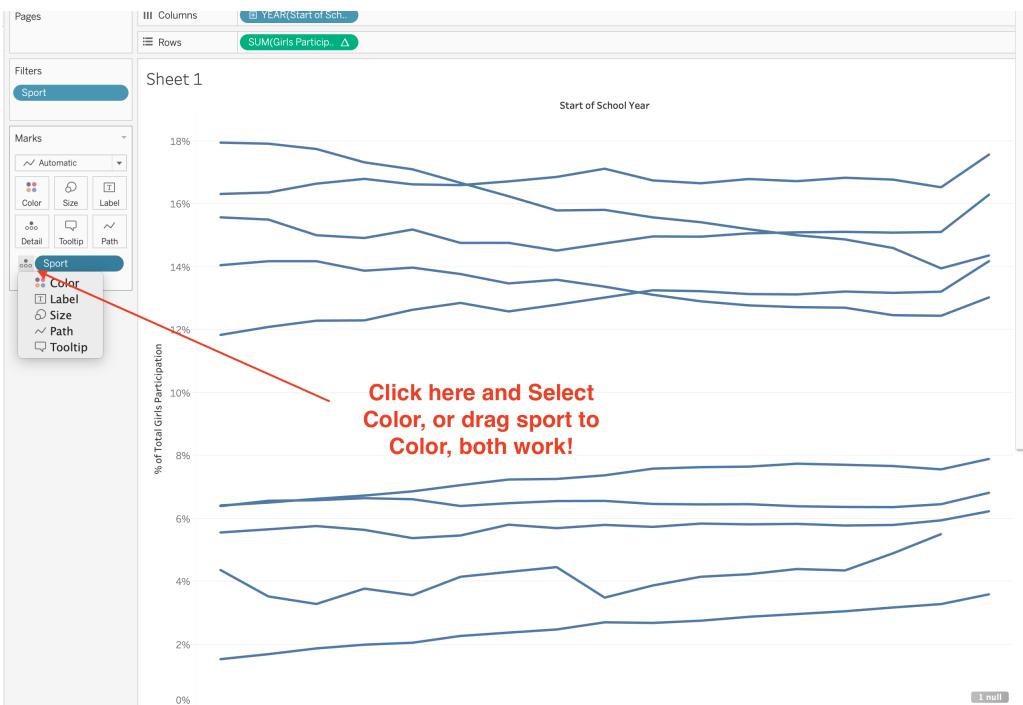
1. We want to filter the data by "Sports", so right click on "Sports" under Marks. Select "Filter"
2. A window will pop up with lots of options. Here we will select "Top". There are many options in the window. We are just going to select Filter Top 10 by Girls Participation Sum, then hit okay



Now our figure is much less noisy, but we still should implement a few more changes. Next what we will do is allow each line to be a different color. We can do this in one step. All we have to do is drag "Sport" under Marks to Color. Alternatively you can click on the little symbol next to "Sport" and select color.

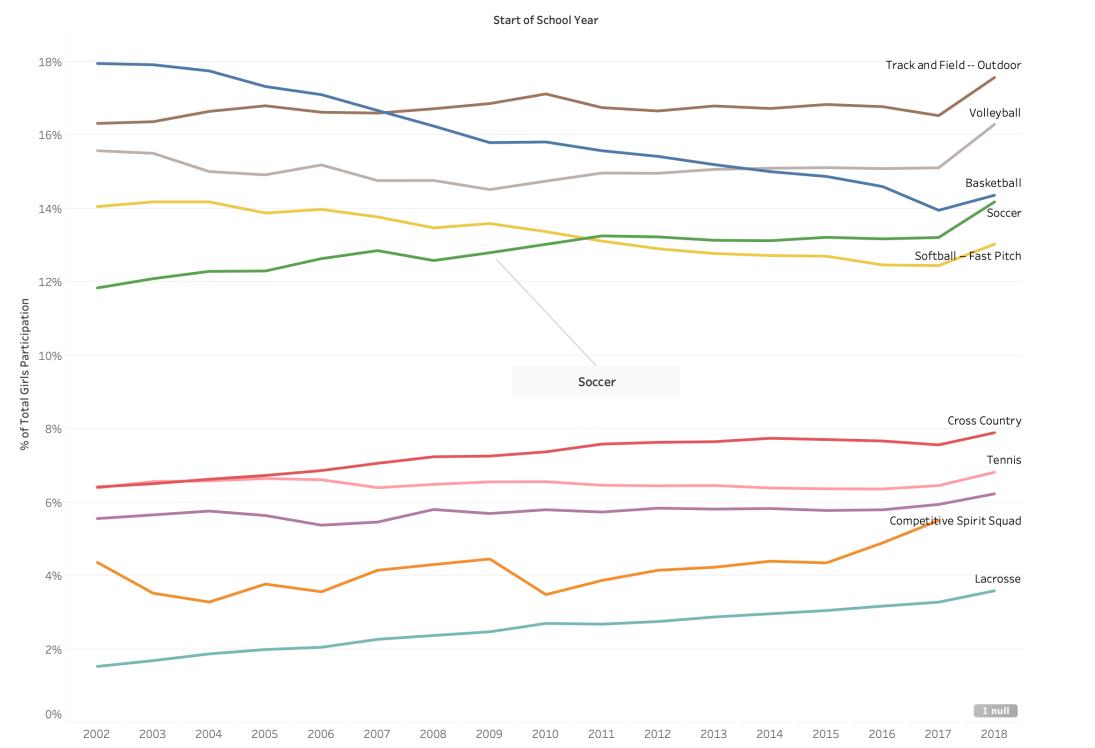


Next we can repeat this process to add labels to the data. All we have to do is drag Sport again under Marks. Now there should be two Sports under marks. On the second iteration of Sport, repeat the process from before, but this time select Labels. As a finishing touch, because Soccer is the main star of the figure we can add an additional label to Soccer. Right click on the soccer line where you want the label. Select **Annotate -> Mark** and a window will pop up where you can add a new label. I chose just to label it as Soccer, then moved the label to a more readable location.



Now our figure is done! Congrats, we have just finished our first workbook. All that is left to do is to give it a name, which you can do by right clicking on "Sheet 1" on the bottom corner, click rename and name it as you like. I picked "Girls Soccer Compared to Other Sports". The final figure should look something like what is below.

### Girls Soccer Compared to Other Sports



## 1.5 Creating New Data

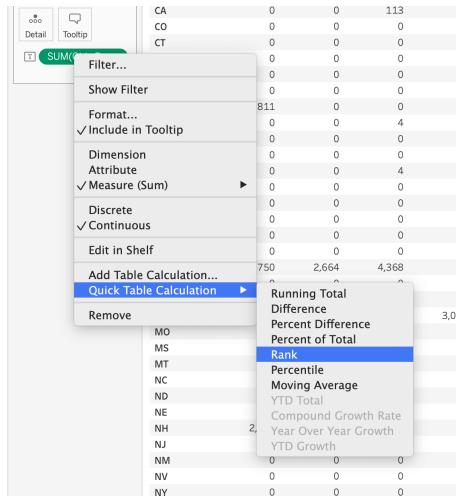
In this section we are going to use our data set to create a new set of data with Tableau. The next section we will make a simple map that shows Girls Soccer Rank in each State. To get the data ready for the map, the process is much simpler if we make another data set if all we want represent soccer's rank compared to other sports within that state. The first step is to make a new worksheet. Just as a reminder all you have to do is select "New Worksheet" in the bottom left corner.

The screenshot shows the Tableau interface with a data source loaded. At the bottom, there are tabs for 'Data Source' and 'Sheet 1'. A red box highlights the 'Sheet 1' tab, and a red arrow points from the text 'New Worksheet' above it to the tab itself. The main area displays a data preview with columns: Participation Date Year, Start of School Year, End of School Year, State, and Sport. The data shows various participation records for different states and sports across two years.

Let's go ahead and rename this sheet: "Soccer State Rank" by right clicking sheet 2 and selecting rename. Then we will drag over State as the "Rows", Girls Participation as the data, and State as the "Columns"

The screenshot shows the 'Soccer State Rank' sheet in Tableau. The 'Tables' shelf on the left lists fields: End of School Year, Sport, Start of School Year, State, Year, Measure Names, Boys Participation, Boys School, Girls Participation, Girls School, Latitude (generated), Longitude (generated), Participation Data (Count), and Measure Values. Red arrows point from the 'State' field in the 'Tables' shelf to both the 'Rows' and 'Columns' sections of the visualization. The visualization area has three columns: 'Rows' (labeled 'Soccer State Rank'), 'Marks' (labeled 'Automatic'), and 'Details' (labeled 'Detail').

We are going to once again take advantage of Tableau's quick calculations. Right click on "Sum(Girls Participation)". Then select **Quick Table Calculation -> Rank**



Double check that the rank calculation is across each step by right clicking on "Sum(Girls Participation)" and selecting **Compute Using -> Table (Across)**. Now that we have the data we want, we will export the data into a new file. Scroll over to soccer. When you hover over soccer a box will appear. From the box we will select "View Data" as shown below.

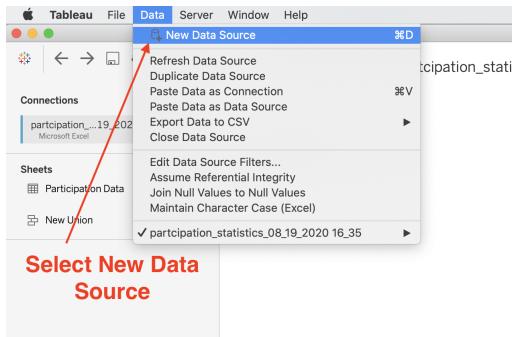
	Sport								
	Soccer	Soft Te..	Softball..	Softball..	Squash	Surfing	Swimmi..	Synchr..	Team T..
9	29								
4	14								
18	38								
8	18								
18	29								
7	23								
13	23								
14	23								
16	26								
16	26								
9	29								
16	36								
8	18								
28	26								
5	28								
12	22								

Click here

Then we will choose to export all as shown. **Remember where you save the file, because we will use it in the next step.**

View Data: Soccer State Rank		
<input checked="" type="checkbox"/> Show aliases <span style="float: right;">Copy Export All</span>		
State	Sport	Rank of Girls Participation
WY	Soccer	4
WV	Soccer	6
WI	Soccer	5
WA	Soccer	3
VT	Soccer	1
VA	Soccer	2
UT	Soccer	4
TX	Soccer	6
TN	Soccer	2
SD	Soccer	9
SC	Soccer	5
RI	Soccer	1
PA	Soccer	4
OR	Soccer	4
OK	Soccer	6
OH	Soccer	5
NY	Soccer	1

Click on the "Data Source" in the bottom right hand corner to go back to the data page. Go to the top of the screen. Select **Data -> New Data Source**



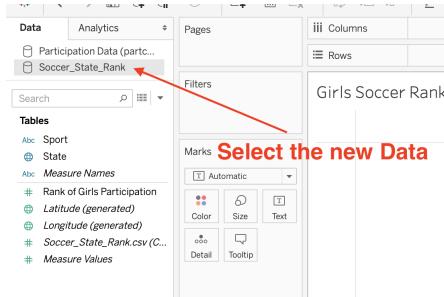
A new window will pop up and ask what type of file. Select text file and then find the file on your local disk and import it. Now we have successfully imported the data that we will use for the map. Create a new worksheet and we are ready to start the map!

Select “Text File” and then import the data file we just saved

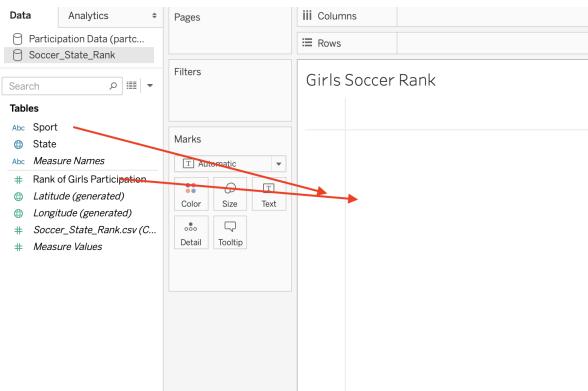
Year	Date	Value	Category	
2018/2019	1/1/2018	1/1/2019	AL	A
2018/2019	1/1/2018	1/1/2019	AL	A
2018/2019	1/1/2018	1/1/2019	AL	A
2018/2019	1/1/2018	1/1/2019	AL	B

## 1.6 Figure 2: Making a Simple Map

In this section we will create a simple map using the data we just imported. I started by creating a new worksheet and renaming it as "Girls Soccer Rank". The first step is to make sure we have selected the new data. We can check by looking at which data is selected in the top left of the screen.



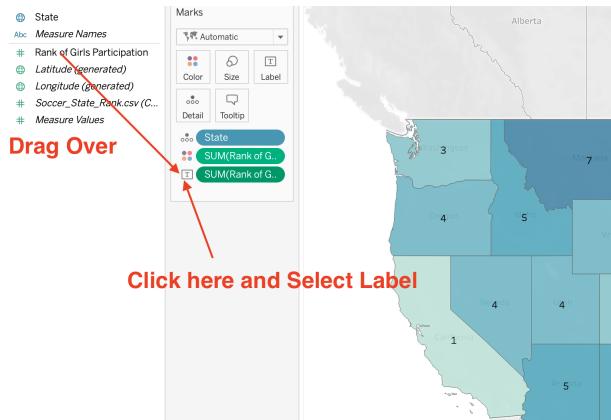
Once we are sure to be using the correct data, we can start dragging over the variables. Use State as the "Rows", then Rank of Girls Participation as the data.



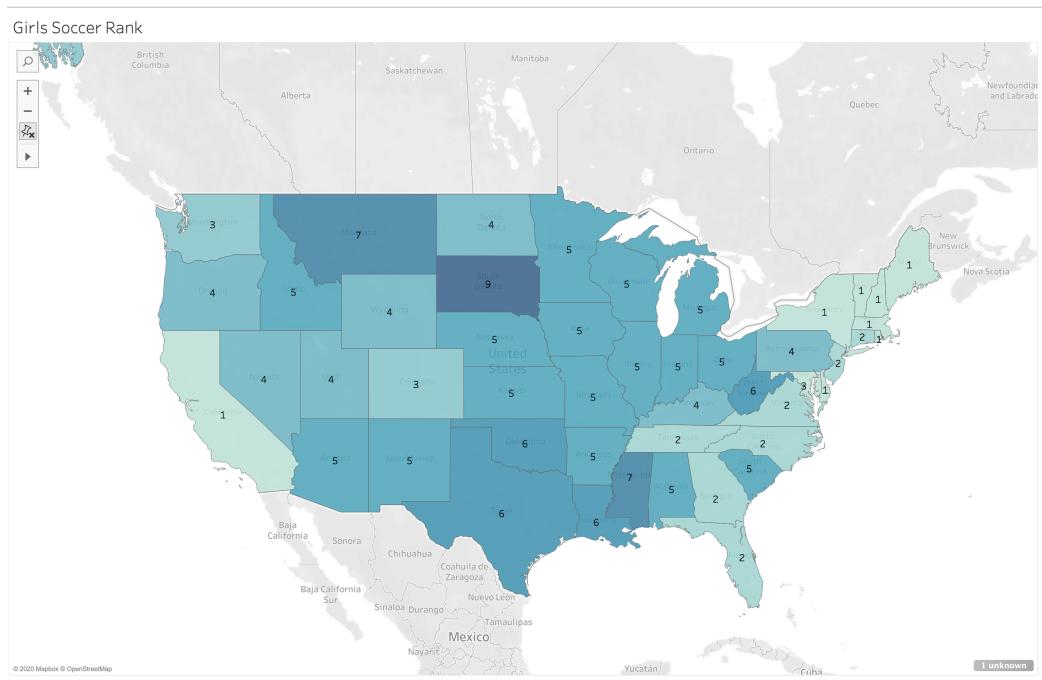
Then we will use "Show me" again to create the figure. This time we are going to select "Maps". In this scenario this is not much more to do. Because we already put our data in a way Tableau understands, Tableau is able to generate an already functioning map. From here what I chose to do was to recenter the map over the Contiguous United States.



In order to make the map more readable, I add labels. Just like in the last figure, to add the labels, drag "Rank of Girls Participation" under Marks, then click on the symbol next to marks and select "label". Now each state should show where Girls soccer ranks in that state compared to other sports.



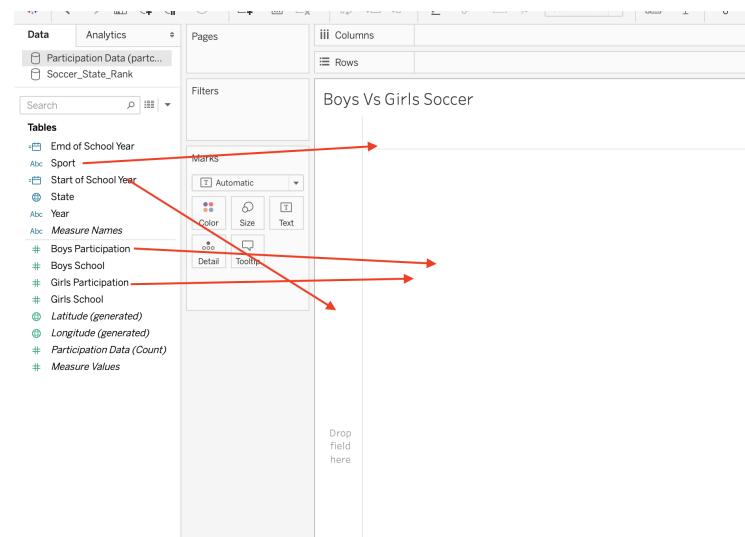
Now we have our completed second figure. The finished product should look something like the image below. There are plenty other options for customization you can play with, but for now this will suffice.



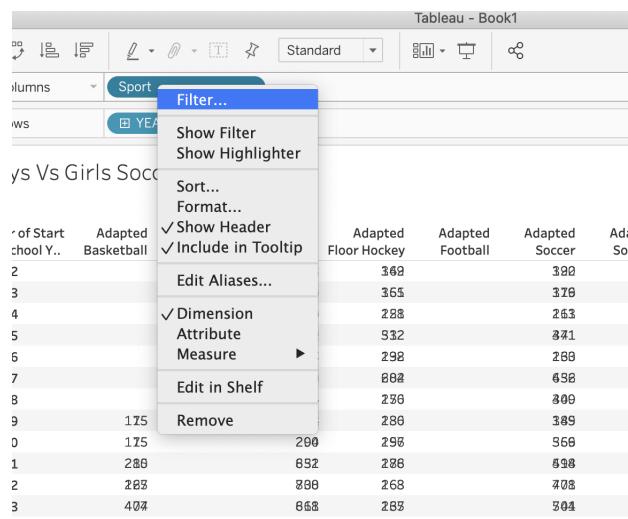
## 1.7 Figure 3: Creating A Comparative Bar graph

In this section we will create our third and final figure. To begin, click on the bottom left corner to create a new worksheet. Go ahead and rename the sheet. I named the sheet "Boys vs Girls Soccer", because the figure will show the comparative trends of boys vs girls high school soccer from our data set. Once we have the new sheet up, we need to make sure we have selected the original data again. Then we need to select the data we will be using.

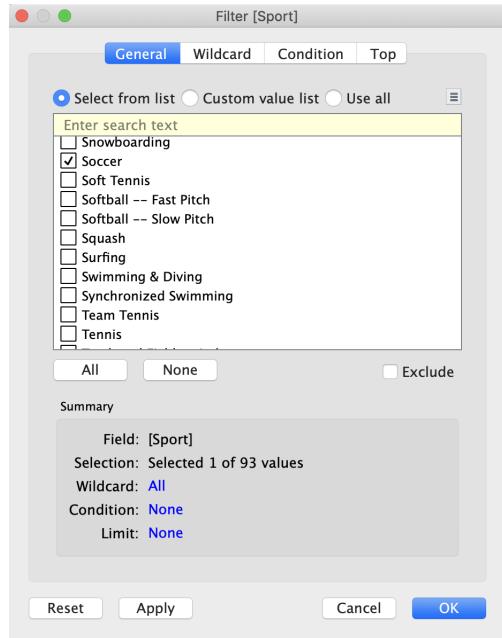
In order to create the bar graph, the data we are going to need is : Start of School Year, Boys Participation, Girls Participation, and Sport. Drag the School year as the row, Sports as the columns and then each participation variable as the data.



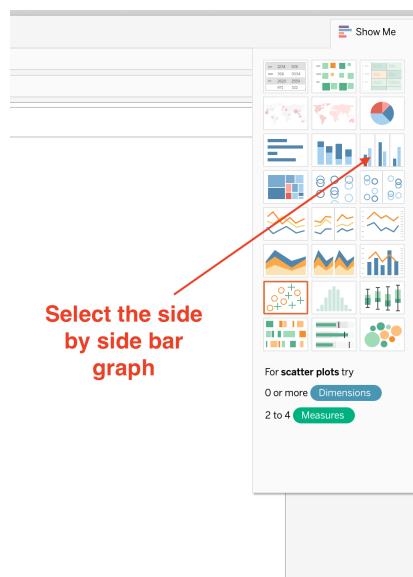
For this figure, we only need the data from soccer. To accomplish this we will utilize the "Filter" feature again. Right Click on "Sport" under columns and click on Filter.



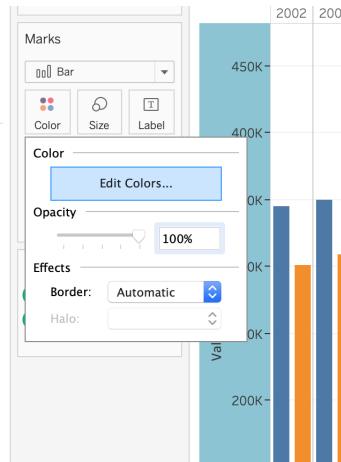
A new window will populate. Click on "None" to deselect all of the sports. Then select Soccer and click okay. Now only the soccer data will be showing.



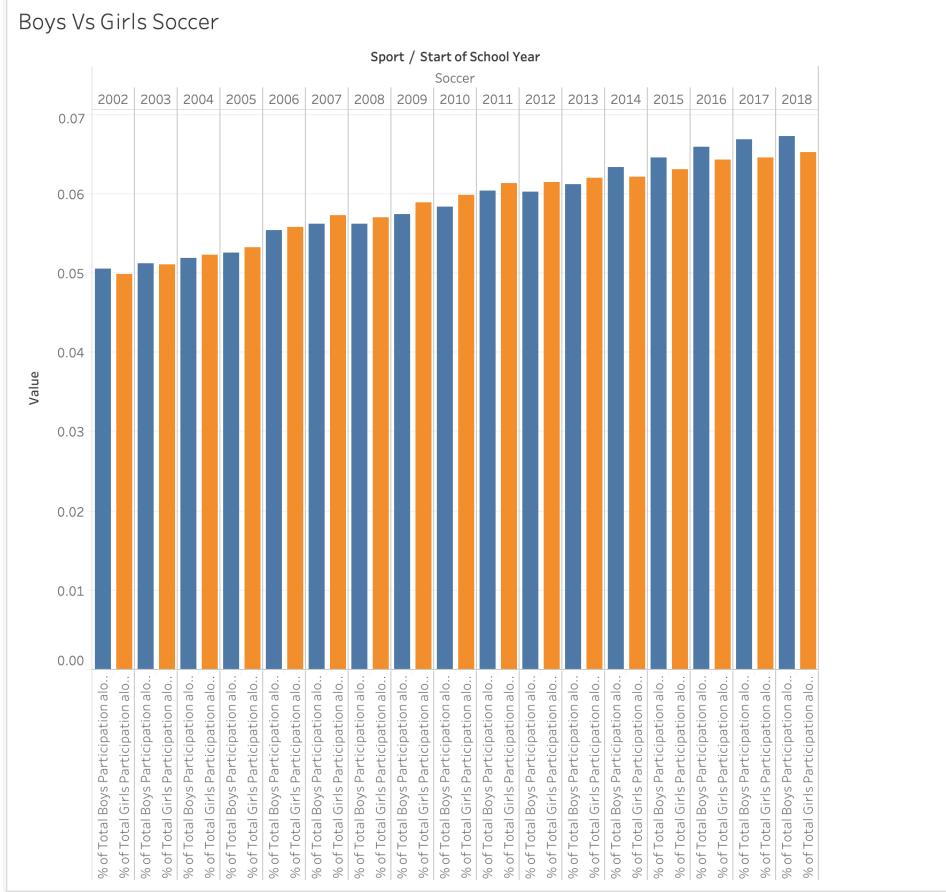
Now we are ready to select the figure. Click show me and select the side by side bar graph. Once you select this option the graph will populate on the screen.



Now we could stop here. This figure is already clean and readable. However we are free to customize the figure as we like. One option is changing the colors of each bar graph. To edit the color, click on colors under Marks and select edit colors. A new window will appear where you can change the colors of the bars.

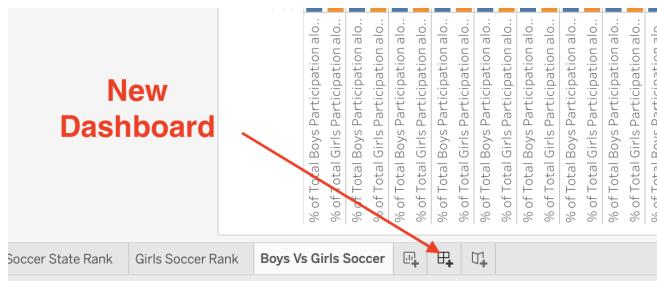


To make this chart a better comparison, we could compare percent of total across each year for girls and boys. In [the first worksheet](#) we covered how to do this, if you would like to add this to the figure. Otherwise we are ready to prepare the dashboard. The finished graph should look something like the figure below.

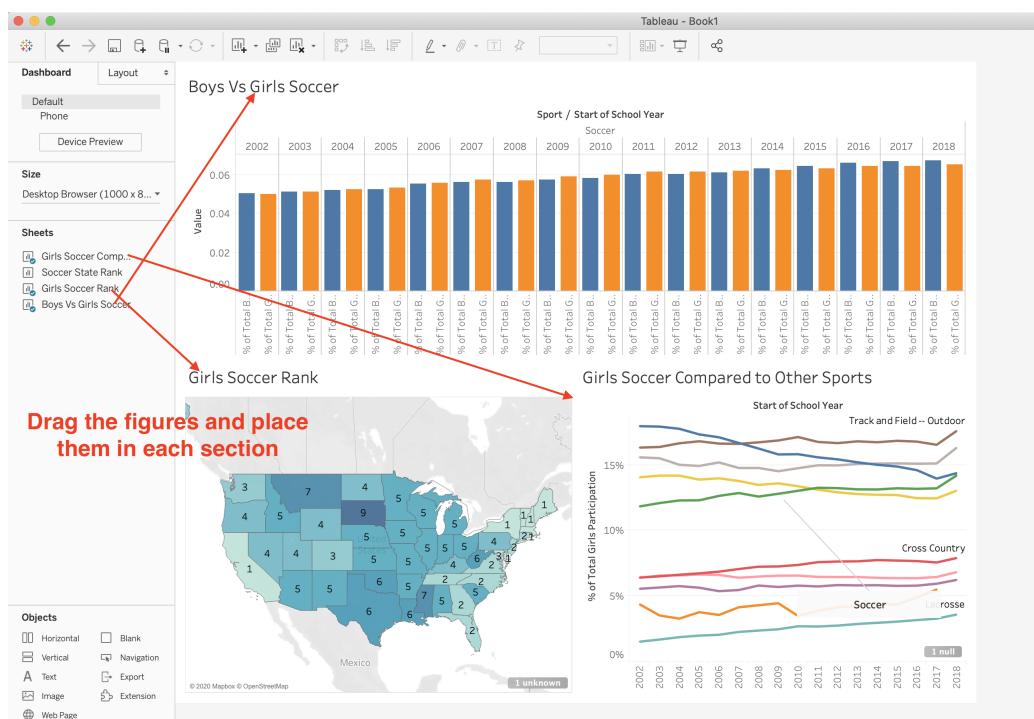


## 1.8 Dashboard: Putting it all together

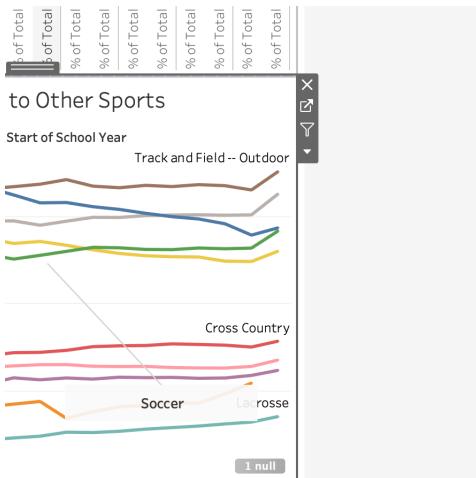
In this final section we will combine our three figures into a dashboard. Most of the hard work is already over and this section is drag, drop, and move around. Begin by going to the bottom of the screen, click the button to create a new dashboard. This button is next to the button for creating a new worksheet.



Now all you have to do is drag each of the three figures and arrange them as you like.



If you need to delete a certain figure, as you hover over it a box will present itself in the corner with a little x to remove the figure. When you drag over the figure, the legend for the figure will also populate. Because we labeled the data clear, we can delete these legends from the dashboard.



Rearrange the figures as you like and then the dashboard is done. A neat feature of the dashboard is if you want to edit one of your figures, you can edit them in the original sheet and the dashboard will update automatically. You can then export this dashboard as a photo, a PowerPoint, a live workbook or even publish it online. There will be more to come on what we can do with the dashboard as the semester moves along.