



Desktop Fundamentals Student Guide





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About Tableau for Students

Tableau for Students Program (TFS) supports undergraduate and graduate students who want to develop their data skills in the classroom and prepare for the future workforce. The program [offers free](#) Tableau software and resources to full-time students who are enrolled in accredited academic institutions. The TFS program offers a renewable and free Tableau Prep, Tableau Desktop, and eLearning license.



Section One

Introduction to Tableau Desktop and the Tableau Workflow

Exploring Tableau Terminology

Plan and Objectives

Introduction

This module starts with exploring the Tableau platform and its general terminology. The module will explain how Tableau uses colors for visual cues. It will explore the Tableau workflow and the anatomy of a visualization.

Objectives:

At the end of this module, students will be able to

- Illustrate the process to set up and install Tableau Desktop/Public
- Explain the Tableau workflow by setting up a new Tableau workbook

Additional Reading/Resources

Use the links below to expand on the content discussed in class and in the assignment. Each article includes practice walkthroughs. Use the provided in-class activity to further practice what was discussed in the presentation.

- [The Tableau Platform](#)
- [Tableau Visual Cues](#)
- [Tableau Terminology](#)

Walkthrough Assignment

As you begin your Tableau journey, it is important to familiarize yourself with how Tableau works. Using the prompts below, take a quick tour of a sample workbook provided by Tableau.

Exploring Tableau Data Connections and Sources

1. Open Tableau.
2. Locate the **Connect pane** on the left side of the application.



3. Click through and explore the different data connections options.

Notice the four main headers on this pane: Search for Data, To a File, To a Server, and Saved Data Sources. Under these sections, look at the different file and data types available.

4. Locate the three thumbnail images at the bottom of the application.

These sample workbooks provide examples of visualizations possible with Tableau.

5. Open the sample workbook titled **World Indicators**.
6. On the bottom bar, known as the **Status Bar**, click on **Data Source**.
7. Explore the different areas of the **Data Source** tab including the **Left Pane**, **Canvas**, **Table Details (Metadata Grid)**, and **Data Grid**.

The screenshot displays the Tableau Data Source interface for a Microsoft Excel connection. The interface is divided into several key areas:

- Left Pane:** Contains 'Connections' (nasa-meteorite-partone), 'Sheets' (Data Interpreter, Data Dictionary, nasa-meteorite), and 'New Union'.
- Canvas:** A large central area with the text 'Canvas' and 'Need more data? Drag tables here to relate them. Learn more'.
- Table Details (Metadata Grid):** A table showing metadata for the 'nasa-meteorite' table, including field names, physical tables, and remote field names.
- Data Grid:** A table showing the first few rows of data from the 'nasa-meteorite' table.

Type	Field Name	Physical Table	Remote Field Na...
Abc	Id	nasa-meteorite	Id
Abc	Fall	nasa-meteorite	Fall

Id	Name	Nametype	Recclass	Location
row-hzx5-myx1-ktcf	Fell	Valid	L5	50.775
row-rcr3.5w34_59cn	Fell	Valid	H6	56.183
row-gffa_citp-4gu8	Fell	Valid	EH4	54.216
row-tw78-y449.cqjk	Fell	Valid	Acapulcoite	16.883
row-adit.5t7p.agsg	Fell	Valid	L6	-33.166

The Tableau Data Source

Exploring Tableau Workspace

1. On the **Status Bar**, open the sheet titled **Care Spend**.
2. Locate the important application key features highlighted below.



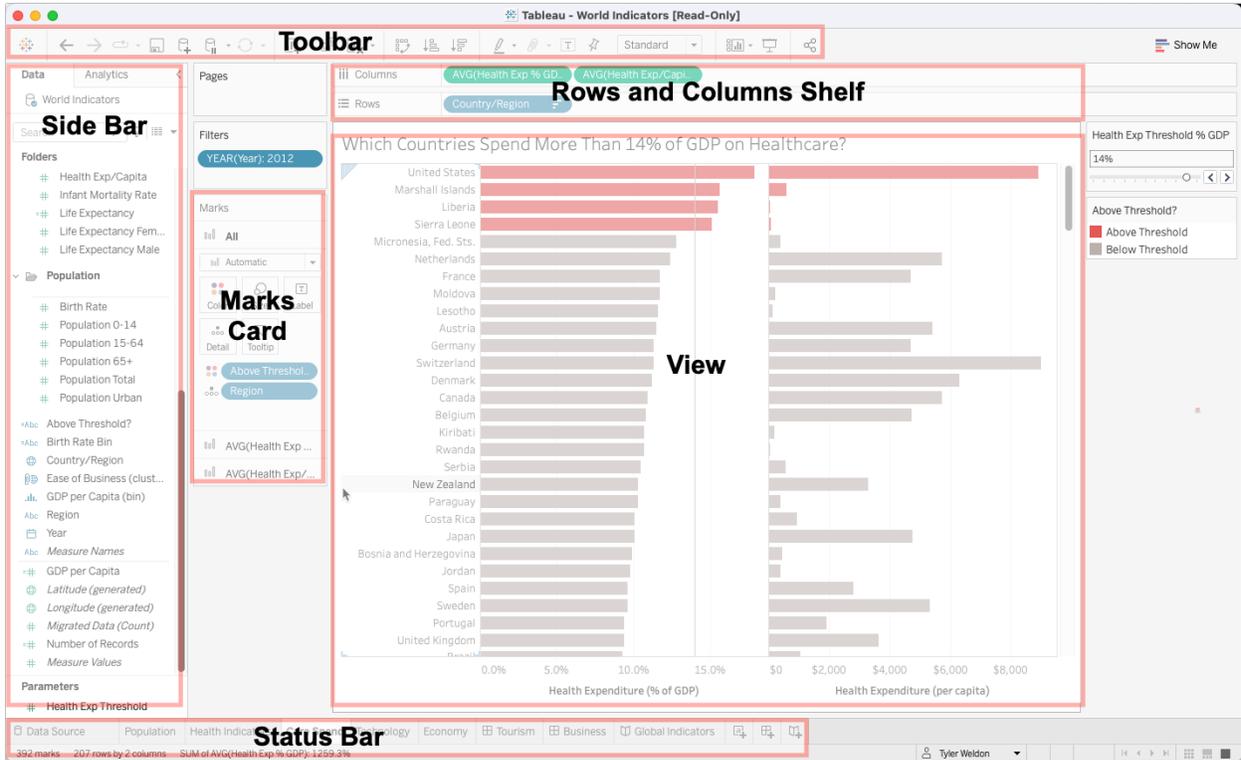


Tableau worksheet view

3. Navigate to the **Side Bar**.

Notice the data fields are grouped together by folders. Grouping can be changed using the dropdown menu next to the search bar.

Look at the different data fields and the icons that represent them. Use the table on [Tableau's website](https://www.tableau.com/learn/articles/data-types) as a reference. How many different data types do you see?

4. Navigate to the **Marks** card.
5. Click through the different marks options, notice how the appearance can change depending on your selection.



Configuring and Setting Up Your Data

Plan and Objectives

Introduction

This module will explore how to get data into Tableau. The module explores how to connect to different data types, how to change data sources, how to modify the data source and how to extract data from the data source.

Objectives

At the end of this module, students will be able to:

- Illustrate the process of connecting and cleaning data using Tableau
- Organize data in an efficient manner using Tableau data pane
- Modify a data set using a split and/or pivot
- Distinguish the difference between a relationship and a join when connecting tables
- Choose the appropriate data connection based on the performance need of the Tableau visualization

Additional Reading/Resources

Use the links below to expand on the content discussed in class and in the assignment. Each article includes practice walkthroughs. Use the provided in-class activity to further practice what was discussed in the presentation.

- [Swapping and updating a data source](#)
- [Cleaning Data using the Data Interpreter](#)
- [Further exploring the Physical and Logical layers of Tableau](#)
- [Splitting a field into multiple fields](#)
- [Pivoting data in Tableau](#)

Walkthrough Assignment

Data preparation is a key part of a successful visualization. Data is not always provided in a usable manner. It is up to the visualizer to review the data and decide if further action should take place. Follow along with the prompt to practice cleaning and organizing data using Tableau.



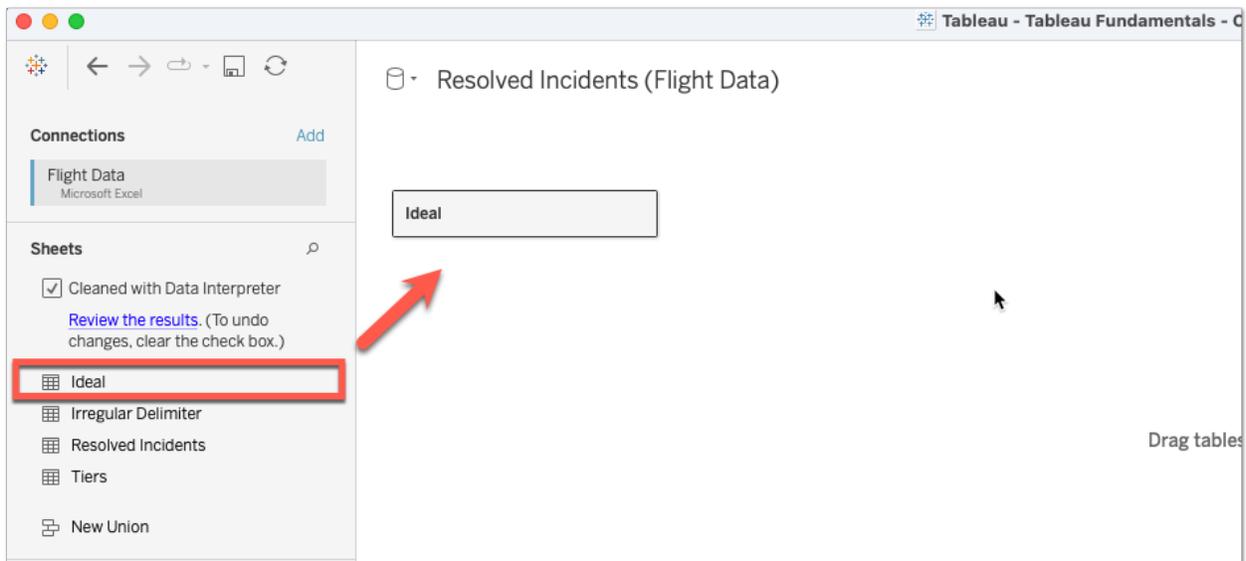


Working with a local airline, you were asked to help clean up their data.

Looking at the data, you noticed the file includes a title and notes. This will need to be removed before successful visualization can take place. Using Tableau, initially clean and prepare the data for visualization.

Connecting and initial clean

1. Open **Tableau** and click **Connect to Data**.
2. Select **Microsoft Excel** under the **To a File** section.
3. Locate the file **Flight Data** file located in the exercise files.
4. Drag the sheet **Ideal** to the **Canvas**.



Tables can be dragged to the Canvas on the Data Source

Open the Table Details (Metadata grid). Looking at the different data types, notice that there are three different types represented. Each type is represented by an icon under the Type column. Clicking on the icon provides the option to change the data type.

Name	Abc	#	Abc	+#	
Ideal	Ideal	Ideal	Calculation	Calculation	
Date	Employee	Resolved Incidents	Location	Employee Id	
1/1/2014	B-002	4	B	2	
1/1/2014	E-055	1	E	55	
1/1/2014	E-075	14	E	75	
1/1/2014	B-066	4	B	66	
1/1/2014	C-025	17	C	25	
1/1/2014	E-030	2	E	30	
1/1/2014	C-001	14	C	1	
1/1/2014	E-038	4	E	38	
1/1/2014	C-054	2	C	54	

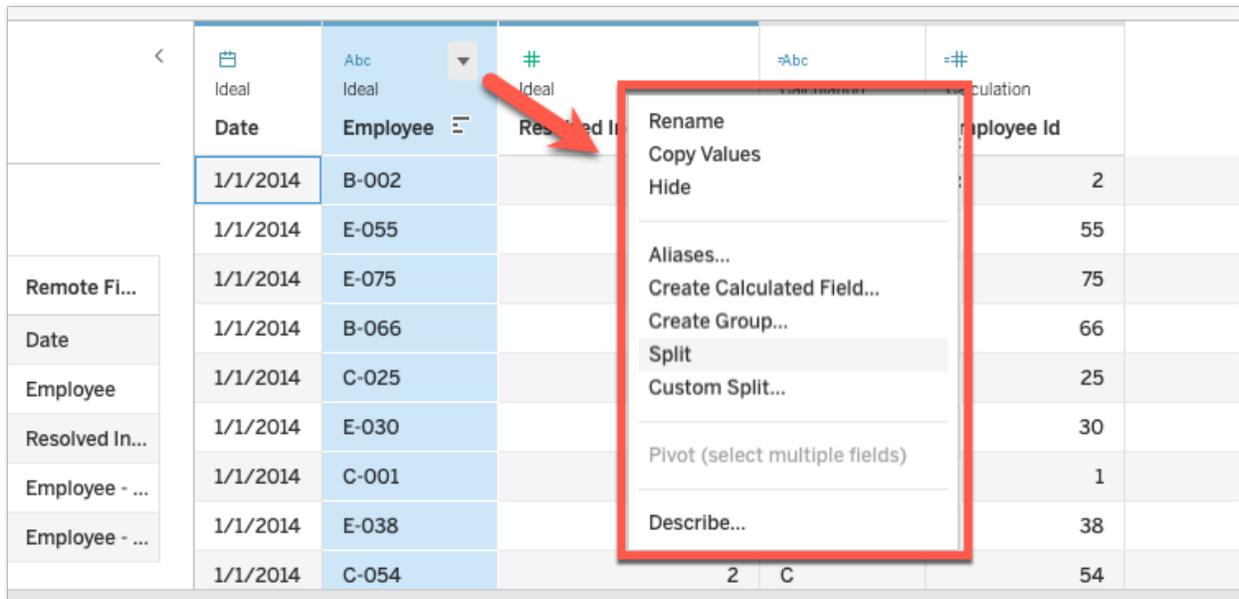
Example of Table Details (Metadata grid)



Splitting data

Looking at the data, you noticed the Employee field is actually two pieces of information. It includes a location code (A, B, C, D, or E) followed by an Employee ID number. You can split the column based on the hyphen delimiter:

1. Select the **Employee** column and click the down arrow in the upper right corner.
2. Select **Split** from the dropdown menu.



	Date	Employee	Resolved In...	Employee Id
	1/1/2014	B-002		2
	1/1/2014	E-055		55
Remote Fi...	1/1/2014	E-075		75
Date	1/1/2014	B-066		66
Employee	1/1/2014	C-025		25
Resolved In...	1/1/2014	E-030		30
Employee - ...	1/1/2014	C-001		1
Employee - ...	1/1/2014	E-038		38
	1/1/2014	C-054		54

Dropdown menu option from the Tableau details section

Looking at the Data Grid, two new fields have now been added. Using the Table Details, you can rename the new fields.

3. Select **Employee-Split 1** on the **Table Details** and click the down arrow.
4. Select the **Rename** option on the dropdown menu.
5. Rename **Employee - Split 1** to Location.
6. Repeat the process and rename **Employee - Split 2** to **Employee ID**.

Using the Data Grid is a great way to prepare your data before you start your visualizations.



Name			Employee	Resolved Incidents
Ideal				
Type	Field Name	Physical Table		
	Date	Ideal		
Abc	Employee	Ideal		
#	Resolved Incidents	Ideal		
Abc	Location	Calculation		
#	Employee Id	Calculation		

- Edit...
- Rename
- Copy Values
- Hide
- Delete
- Aliases...
- Create Calculated Field...
- Create Group...
- Create Bins...
- Describe...

Field names can be changed in the Table Details.

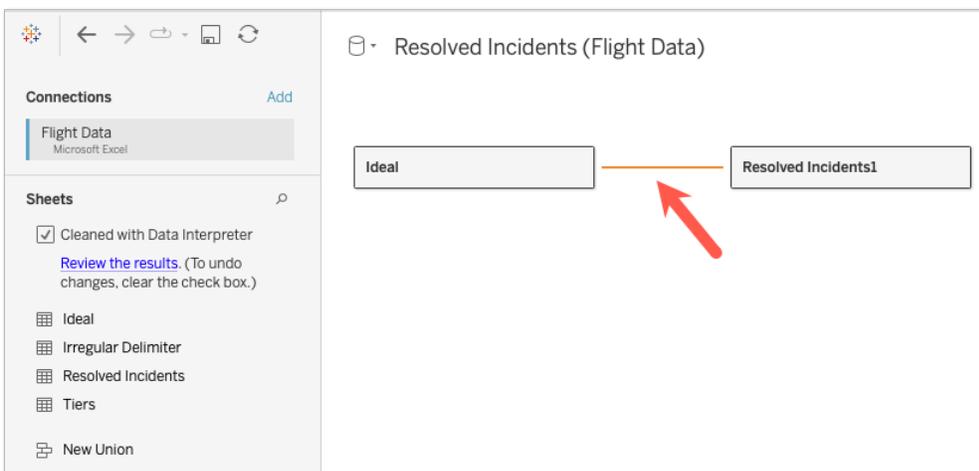
Relationships and Joins

After initially cleaning and examining the data, you decided you want additional details on how many incidents occur each month based on location. Looking at the data set, you identified the Resolved Incidents table to include that information. This table can connect with the Ideal Table using the Tableau Relationships feature.

Create a Relationship

1. Drag the **Table Resolved Incidents** to the **Canvas**.

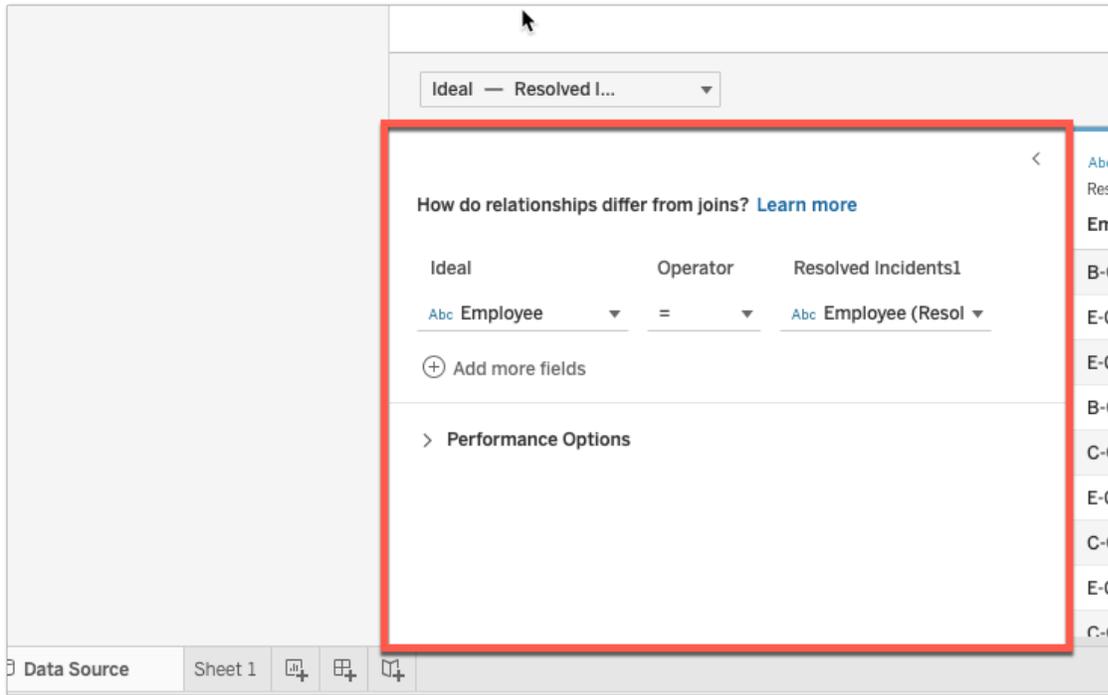
An orange rope will appear to signal the tables have been connected. Click on the orange rope and examine the relationship between the two tables. (This is highlighted in a side menu to the left of the data grid.)



An orange rope signals a relationship between the tables has been created.



2. Ensure that the tables are connected using the **Employee** field.



Clicking on the orange rope opens an Edit Relationship box. This box is in the same location of the Table Details (Metadata Grid).

If the column names for Resolved Incidents do not appear, ensure the box Use Data Interpreter is checked under Sheets.

Create a Join (alternative method)

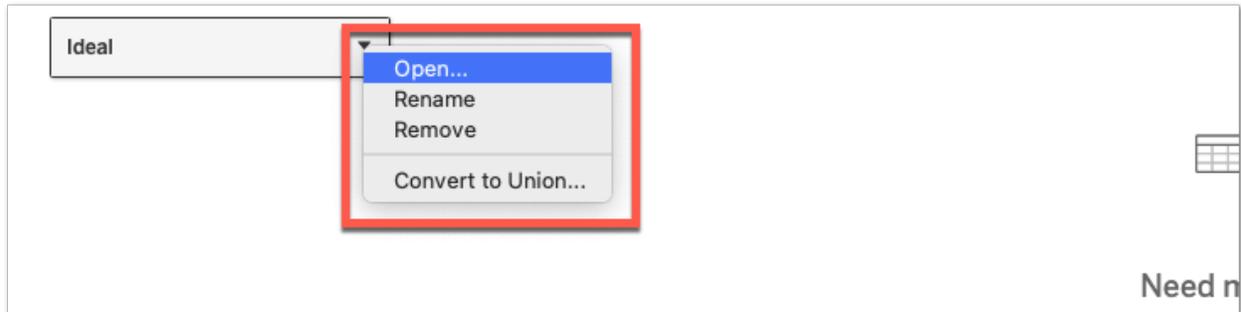
1. Click the down arrow on **Resolved Incidents** by hovering over the table name on the **Canvas**.
2. Select **Remove** from the dropdown menu.



Use the dropdown menu on the table name to remove it from the Canvas.

3. Click the down arrow on **Idea** and select **Open** from the dropdown menu.

4. Click open to review the physical layer of the Canvas.



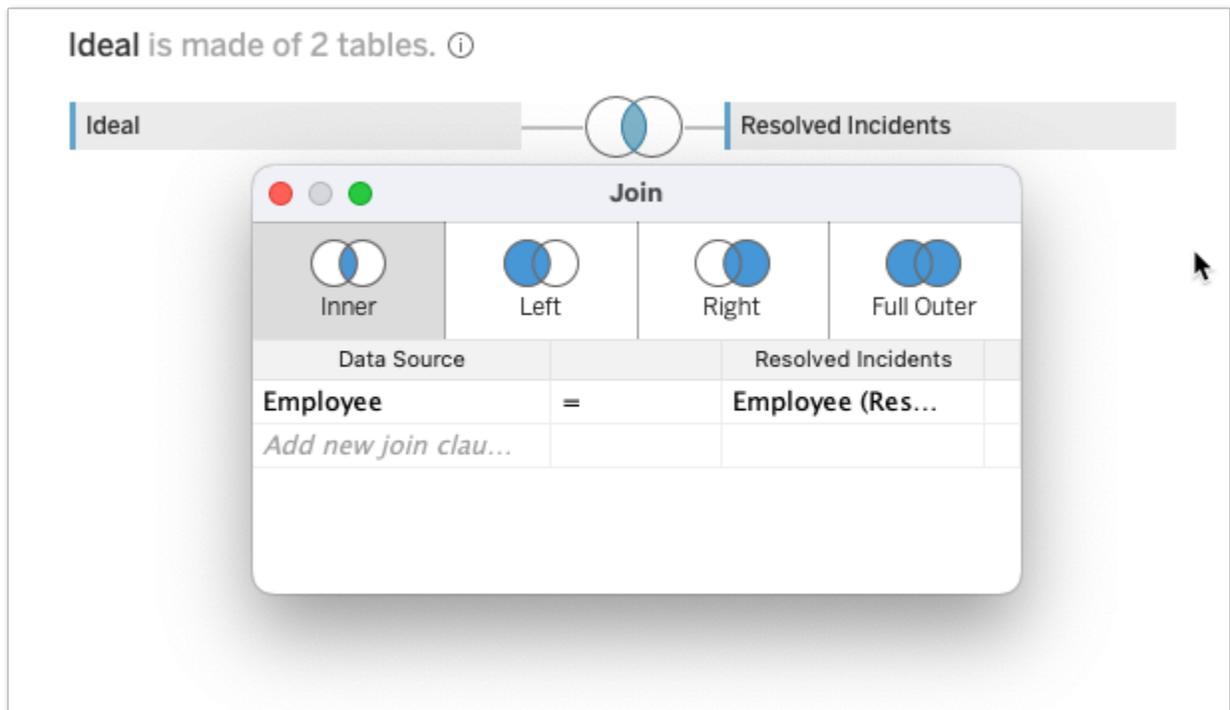
Use the dropdown menu to open the physical layer.

Relationships take place at the logical level while Joins and Unions take place at the physical layer.

5. Drag the table **Resolved Incidents** to the **Canvas**.

A new connection will appear with two interlocking circles between the tables. This indicates a Join is taking place.

6. Click on the interlocking circles to select different **Join** types

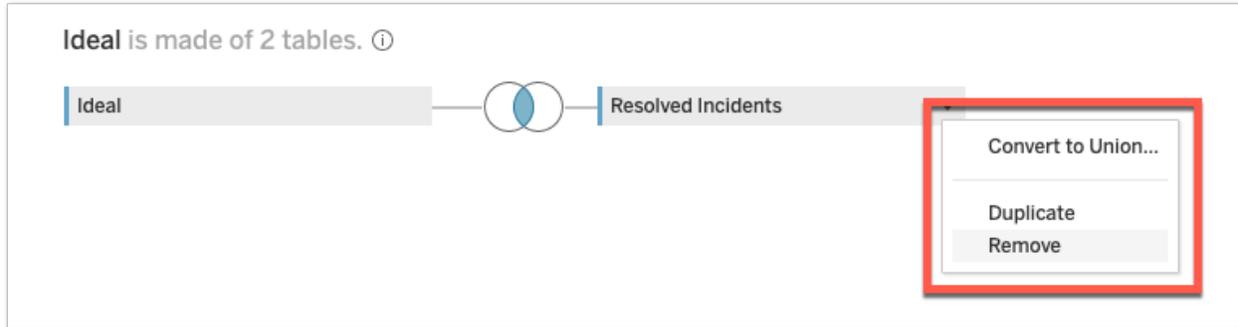


Clicking on the interlocking circles opens the option to select different join types.

Click through the different join options. Notice how the amount of rows returned in the data grid changes based on the join type. Circling through the different join types, notice how an Outer Join achieves similar results to that of a Relationship Join.



Remove the Join and close the physical layer. Rebuild the relationship between Ideal and Resolved Incidents.



Use the dropdown menu on the table name to remove the item from the physical layer.

Pivoting your Data

After creating the relationship, examine the Resolved Incidents table. You can swap which table appears in the data grid by clicking the table on the Canvas. Notice that each date is an individual column. Tableau prefers that a table is taller than it is wider. You can fix this by pivoting each column into a single row. This will create a single row for dates and a single row for incidents.

1. On the **Data Grid**, select all of the date columns at once.
2. While highlighted, open the dropdown menu on the last column and select **Pivot**.

ents	# Resolved Incidents 4/1/2014	# Resolved Incidents 5/1/2014	# Resolved Incidents 6/1/2014	# Resolved Incidents 7/1/2014	# Resolved Incidents 8/1/2014	# Resolved Incidents 9/1/2014	# Resolved Incidents 12/1/2014
5	2	3	0	3	1	2	5
1	3	4	1	4	0	2	0
16	15	18	16	14	17	12	12
5	2	5	0	0	2	0	3
17	18	17	17	12	15	17	17
1	1	0	3	5	5	0	2
14	14	13	18	17	14	13	18
0	4	0	2	5	0	2	2
4	4	2	3	0	5	5	5

After selecting all the columns, use the dropdown menu to pivot the columns

3. Click on the **Resolved Incidents Table** to view the newly created columns.
4. Open the **Table Details** grid.
5. Rename **Pivot Field Names** to **Incident Date** and change the data type to **Date**.
6. Rename **Pivot Field Values** to **Resolved Incidents**.



Name			Employee	Resolved Incidents
Ideal				
Type	Field Name	Physical Table		
	Date	Ideal		
Abc	Employee	Ideal		
#	Resolved Incidents	Ideal		
Abc	Location	Calculation		
#	Employee Id	Calculation		

- Edit...
- Rename
- Copy Values
- Hide
- Delete
- Aliases...
- Create Calculated Field...
- Create Group...
- Create Bins...
- Describe...

Use the Table Details to rename field names

Extracting your Data

Now that we have created, cleaned, and simplified our data set, let's extract the data. This will help improve performance and combine everything into one table.

1. Check the radio button titled **Extract** in the top right corner of the **Canvas**.
2. Click the **Edit** button beside the radio button to open the **Extract Data Dialog** box.

Resolved Incidents (Flight Data)

Connection Filters
 Live Extract Edit Cancel 0 Add
 Extract will include all data.

Ideal

—

Resolved Incidents1

Data connection types can be changed directly on the Canvas.

Notice the option to select physical tables is grayed out. This is by design since we did not Join or Union any physical tables together. Review the options to further simplify the data including the option to Hide All Unused Fields. Click OK when finished.

3. Select **Sheet 1** on the **Tableau Status Bar** to kick off the production of the extract.
4. Save the file locally on your device.

Notice a new description under the Extract button on the Canvas. The new description provides details on when the last extract was performed.



Section Two

Understanding how and why charts are chosen

Foundations of Chart Visualizations

Plan and Objectives

Introduction

This module will explore the foundations of chart visualization. It will discuss how dimensions and measures make up the foundation of charts. It will demonstrate the difference between discrete and continuous fields. It will explore the key elements of a chart.

Objectives

At the end of this module, students will be able to:

- Distinguish the difference between continuous and discrete fields using Tableau
- Identify how charts are created using dimensions and measures in Tableau
- Change a Tableau chart appearance using axis and labels options

Additional Reading/Resources

The links below expand on the content discussed in this module. Each article includes practice walkthroughs. Use one of the provided data sets from the in-class activity or walkthrough assignment to further practice what was discussed in the presentation.

- [Data field types](#)
- [Default properties of dimensions and measures](#)
- [Converting between continuous and discrete fields](#)
- [Editing axis](#)
- [Show and hide labels](#)

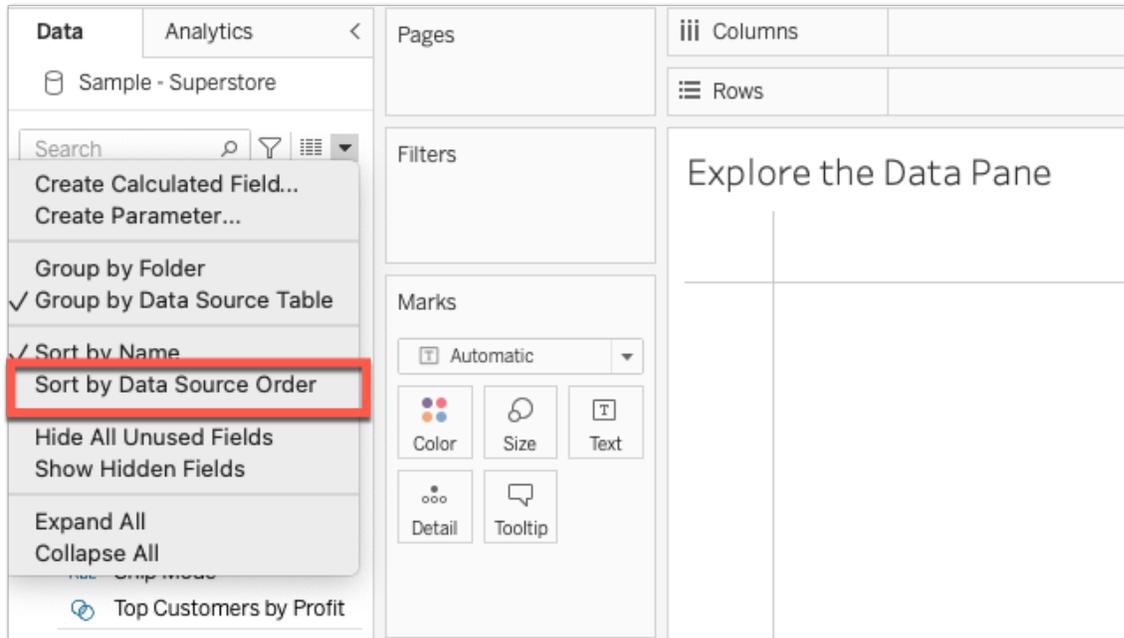
Walkthrough Assignment

Understanding the foundations of a chart is vital to developing your skills in creating data visualizations. Using Tableau, follow the prompts below to explore the different key elements of a chart.



Dimension and Measures

1. Open **Tableau** and click **Connect to Data** on the **Data pane**.
2. On the **Connect pane**, click on **Sample - Superstore** under the **Saved Data Sources** section.
3. Create a new worksheet and rename it **Explore the Data** pane.
4. Locate the dropdown menu next to the search field on the **Data pane**.
5. Open the dropdown menu and change the sort order to **Data Source Order**.



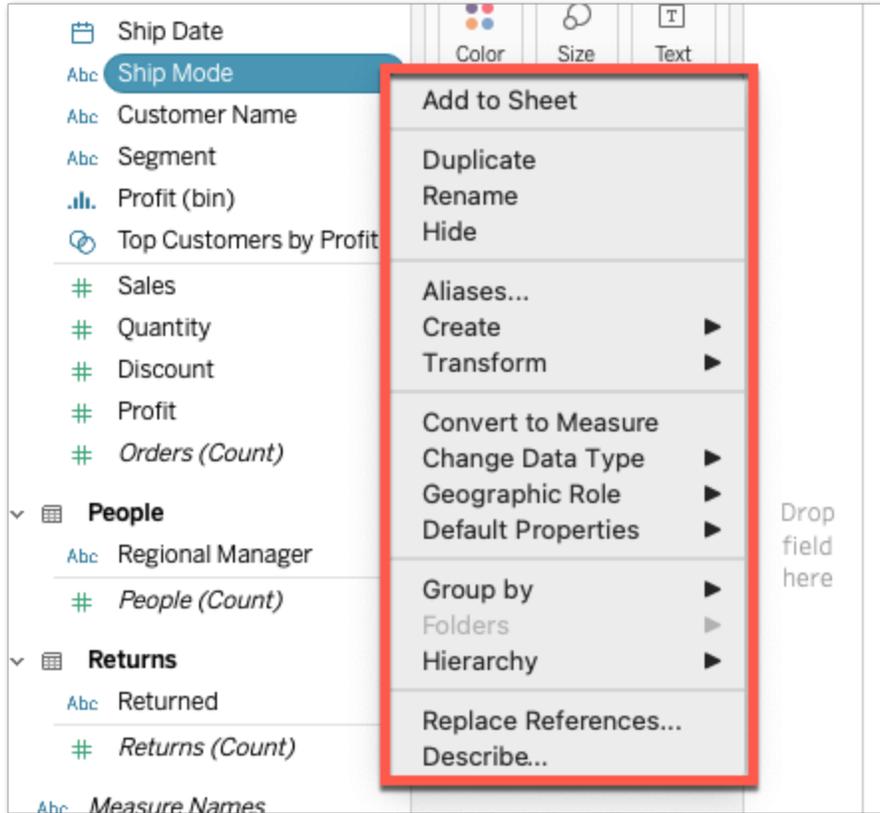
Dropdown menu on the Data pane provides several options

The Dimension and Measures are separated on the Data pane by a horizontal line. Notice the data types that are dimensions and that are measures. Tableau uses different icons to represent the different data types.

6. Locate and click on the dimension **Ship Mode**. Click on the icon beside the name to open the data type menu.
7. Open the dropdown menu by clicking the dropdown arrow to the right of the field name.

This menu includes the option to change the data type and the default properties. Take a few minutes and explore the different options.





Options available through the dropdown menu on a dimension data field.

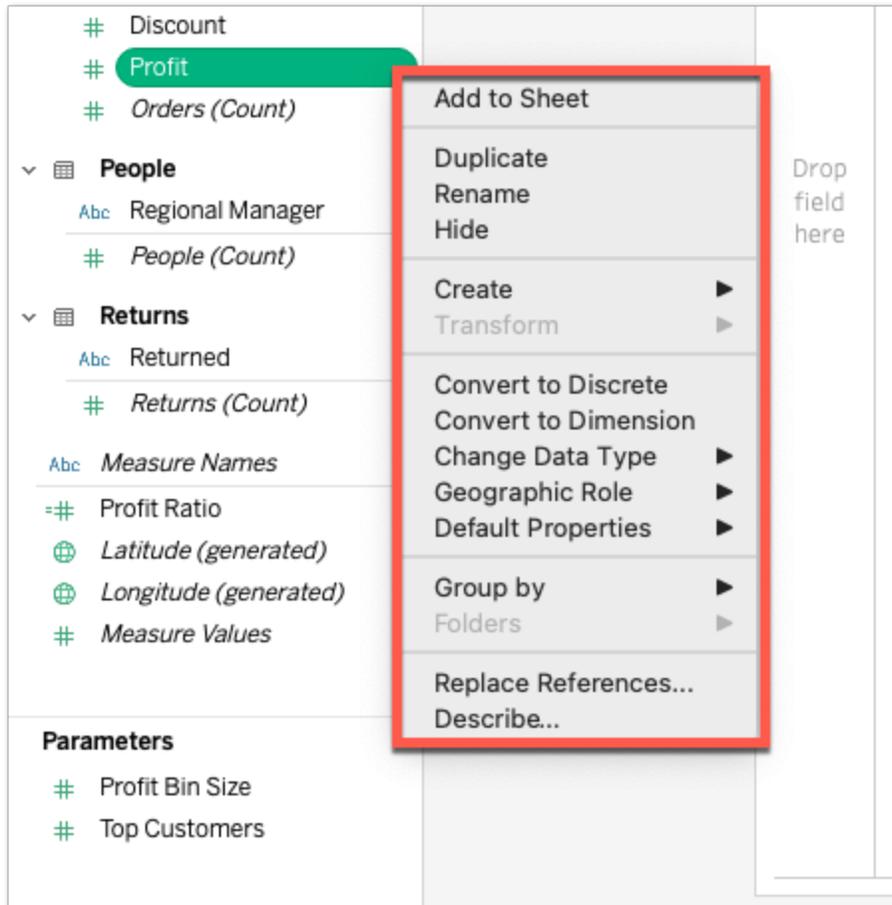
8. Drag this dimension to the column shelf on the view.

Four different categories are now available on the view. This is an example of how dimensions are categorical data that display details of your data.

9. Locate and click on the measure **Profit** under the **Order** table.
10. Open the dropdown menu by clicking the dropdown arrow.

This menu includes the option to change the data type and the default properties. Take a few minutes and explore the different options.





Options available through the dropdown menu on a measure data field.

11. Drag this measure to the **Rows** shelf on the view.

After adding the dimension and measure to the view, a bar chart is created. Looking back at the lecture Exploring Tableau Terminology, a bar chart compares data across categories and requires a dimension and a measure.

12. Open the **Show Me** tab in the top right corner. Other available chart types are highlighted.

13. Cycle through the different available chart types.

Tableau automatically evaluates the selected fields and gives you the option of several types of views that would be appropriate for those fields. Show Me also highlights the visualization type that best matches the data. Any view that is not available based on the data being displayed will be grayed out.



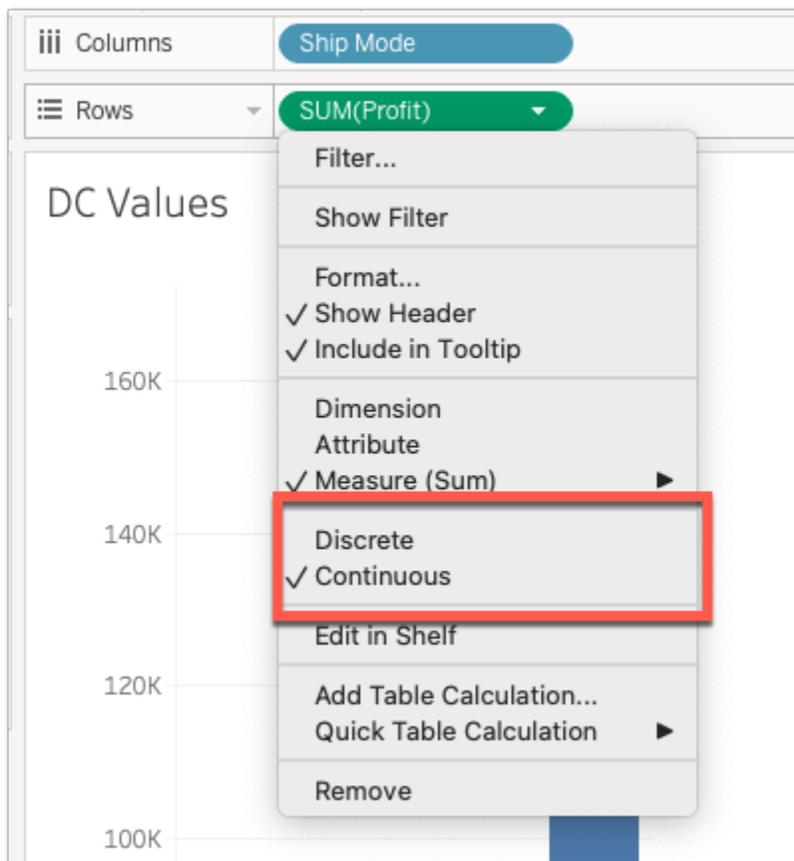
Discrete and Continuous Fields

When data fields are added to the data pane, they are assigned an icon based on the data type. These icons are colored green or blue based on the type of data it is. Continuous fields represent a continuous path without an interruption. Discrete fields are individually separate and distinct.

1. Create a new worksheet and rename it **DC values**.
2. Select the **Ship Mode** dimension and drag it over to the column shelf.
3. Select the **Profit** measure and drag it over to the **Rows** shelf.

Once a dimension or measure has been added to the shelf, it turns a blue or green color. This color signals what type of data (discrete or continuous) you are using.

4. Locate the **Profit** measure that was added to the **Rows** shelf. Right click the field and open the dropdown menu.
5. On the menu, select discrete to change the data type from continuous to discrete.



Dropdown menu available on measure and dimension from the Rows and Columns shelf.

Measures can be converted between continuous and discrete fields. When you swap between types, notice how the chart changes from a bar graph to a cross table. When the measure is continuous, the chart has a continuous axis from 0 - 170k. When the measure is changed to a discrete field, the chart changes to a cross table with distinct profit columns for each Ship Mode. Notice that the discrete values create headers for the cross table.

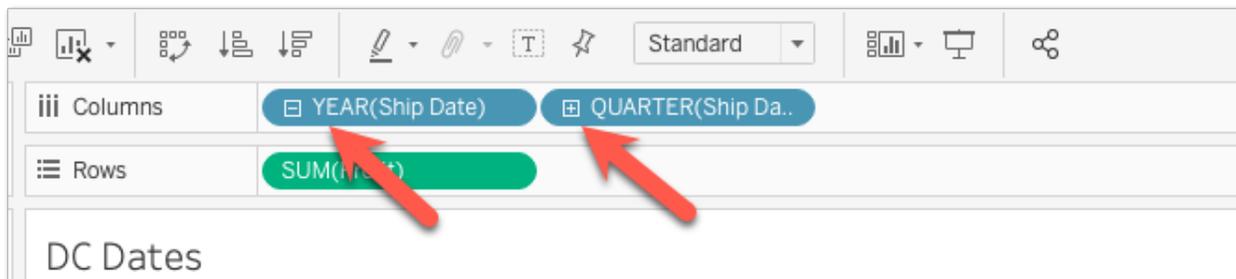
Along with changing the measures on the columns and row shelf, the field types can be changed using the right click method on the Data pane.

Continuous vs. Discrete Dates

Similar to normal data fields, date fields can be either discrete or continuous. With dates, it is important to understand the difference between continuous and discrete.

1. Create a new worksheet and name it **DC dates**.
2. Drag the date field **Ship Date** under the **Orders** table to the Columns shelf and the **Profit** measure to the **Rows** shelf.

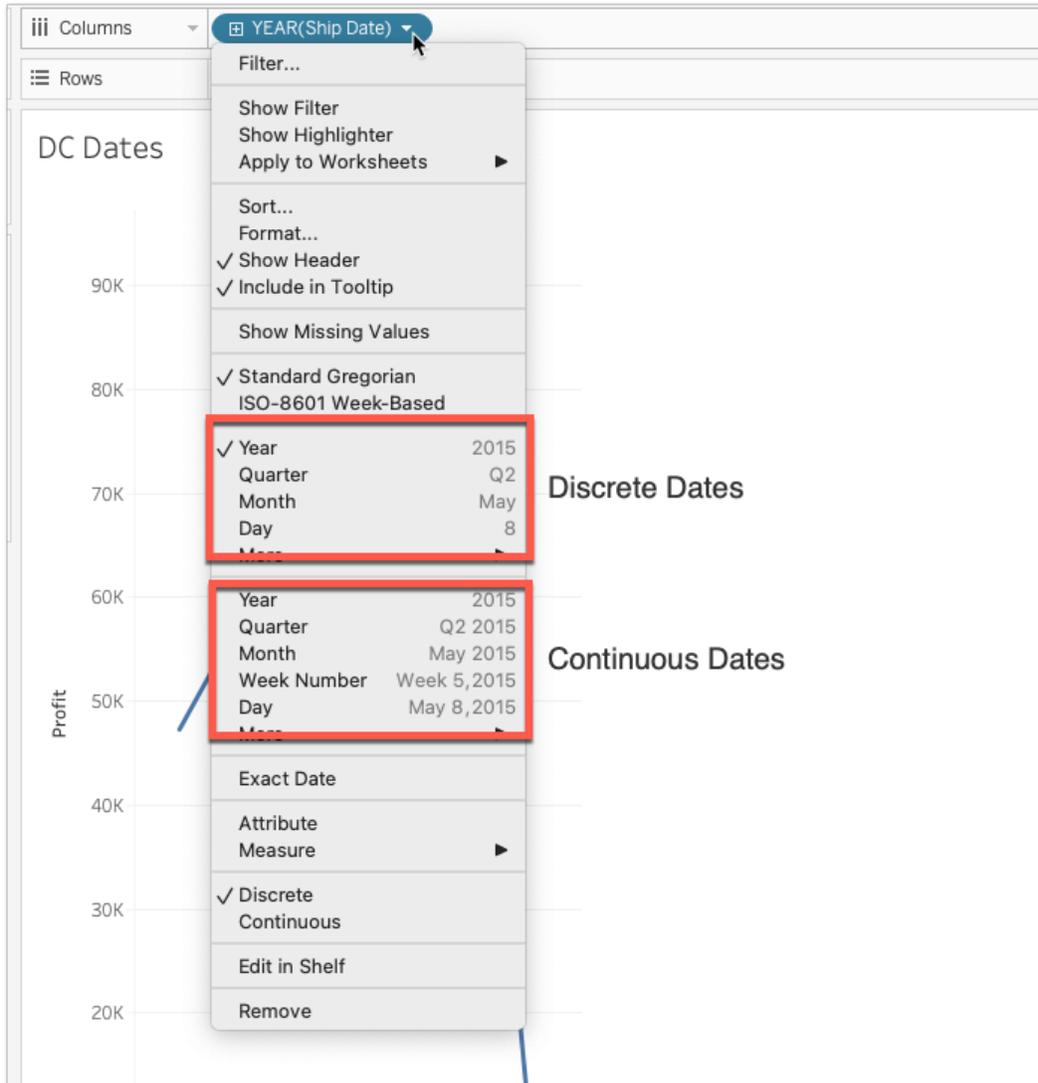
The data field is blue indicating a discrete date field. For discrete date fields, each date is treated like a category. Notice how the date field name is enclosed in parentheses with the word “YEAR” outside the parentheses. This indicates to what level of detail Tableau is using to display the date field.



Discrete dates can be drilled down using the plus (+) and (-) icons.

3. Click the **plus (+)** icon to the left of the word **YEAR** to drill down into the next date category.
4. Click the **minus (-)** icon to move back up in the level of detail.
5. Right click on the dimension and open the dropdown menu.
6. Locate the second set of dates in the menu. The date sets are separated by a horizontal line.
7. Select **Year** to change the date type to a continuous field.





Dates can be swapped between discrete and continuous using the dropdown menu.

After changing the date type, the field will change to a green color on the shelf. The ability to drill down has now been removed. This is because the date field is a continuous field and not separated into categories.

8. Reopen the menu and change the continuous date to **Months**.

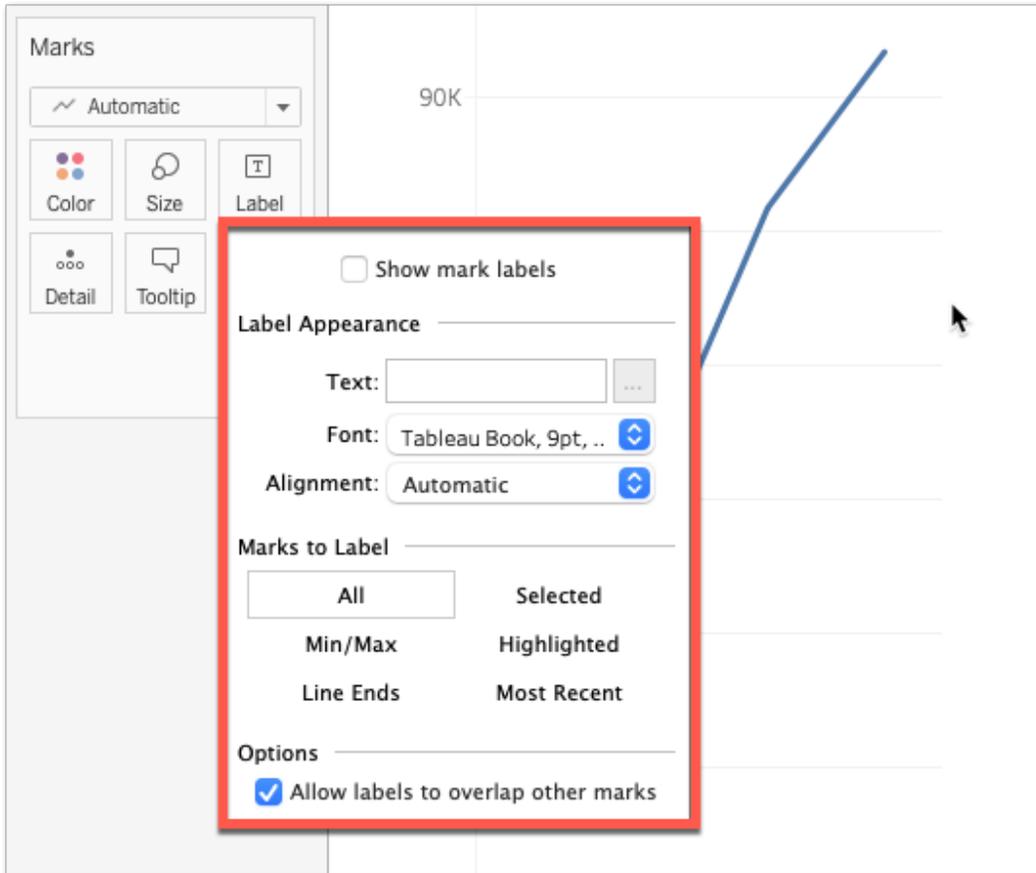
Notice that changing the date type to months provides a data point for each month in each year on a continuous path. Changing the date type back to a discrete month provides one data point for each month (multiple years are included in this one data point).

Axis vs Label

1. Create a new worksheet and name it **Axis and Labels**.



2. Drag the **Order Date** dimension under the **Order** table to the column shelf.
3. Drag the **Profit** measure under the **Order** table to the **Rows** shelf to create a chart with an axis.
4. Drag the **Profit** measure from the data pane to the **Label** mark to add labels for each value.
5. Click on the **Label** mark to open the label dialog box. Use this box to change the appearance of the label.

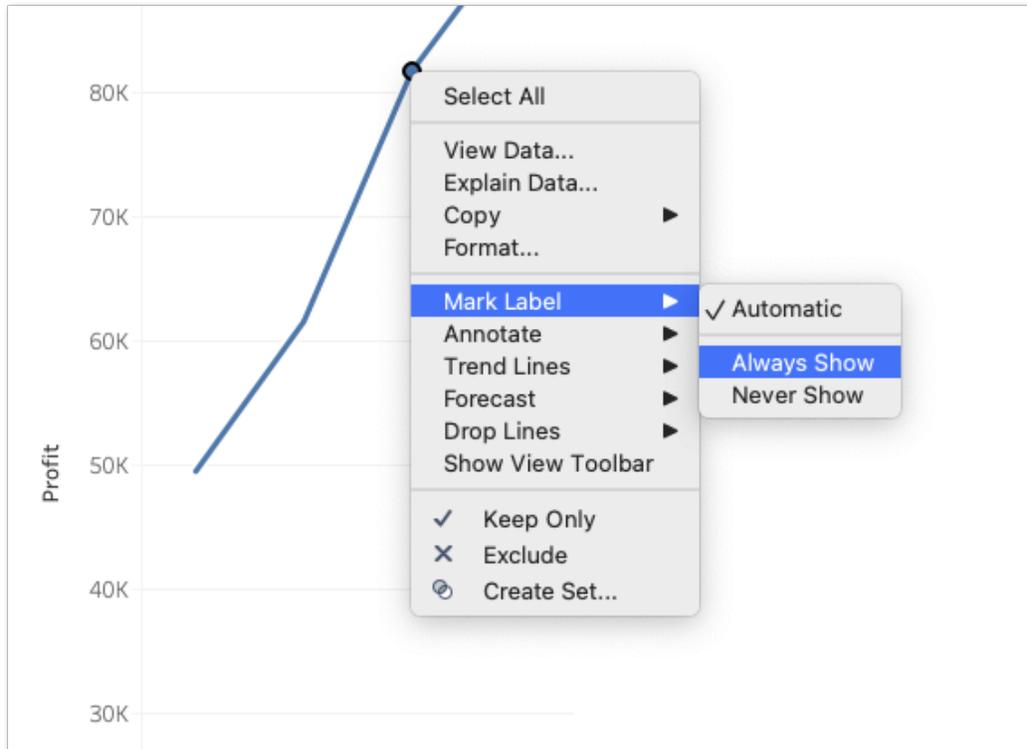


Mark Label options from the Marks card.

6. Right click on one of the values on the line graph path. Using the dropdown menu, select the option to **always show** under the mark label option.

Charts with continuous fields include an axis. Axis labels can be added to all values using the marks card. If you only want to call out a single point, use the right click method on the line graph.





Single point labels can be added directly from the view.

7. Double click the **Profit** axis to open the **Edit Axis** dialog box.
8. Cycle through the different options and notice how the chart changes.
9. Update the title of the chart to **Axis and Labels**.

Common Charts in Tableau

Plan and Objectives

Introduction

This module will explore how to build the common charts of Tableau. Along with detailing how the charts are built, the module will explain why one chart is chosen over another. Common charts detailed in this module include bar graphs, line graphs, scatter plots, maps, and text tables.

Objectives

At the end of this module, students will be able to:

1. Illustrate data using different chart types available in Tableau
2. Arrange data fields into different locations in Tableau to create different chart types
3. Distinguish between the different chart requirements in Tableau

Additional Reading/Resources

Use the links below to expand on the content discussed in class and in the assignment. Each article includes practice walkthroughs. Use the provided in-class activity to further practice what was discussed in the presentation.

- [Building common charts in Tableau](#)
- [Choosing the right chart](#)
- [Building a bar chart](#)
- [Building a line chart](#)
- [Building a scatter plot](#)
- [Building a text table](#)
- [Building a highlight table](#)
- [Building a Tableau map](#)
- [Understanding trend lines](#)
- [Understanding pie charts](#)
- [Understanding tree maps](#)

Walkthrough Assignment

A chart is a representation of data in the form of a graph, diagram, map, or tabular format. The type of chart you use depends on the question you are trying to answer. Using the walkthrough below, answer the following questions about hurricanes.

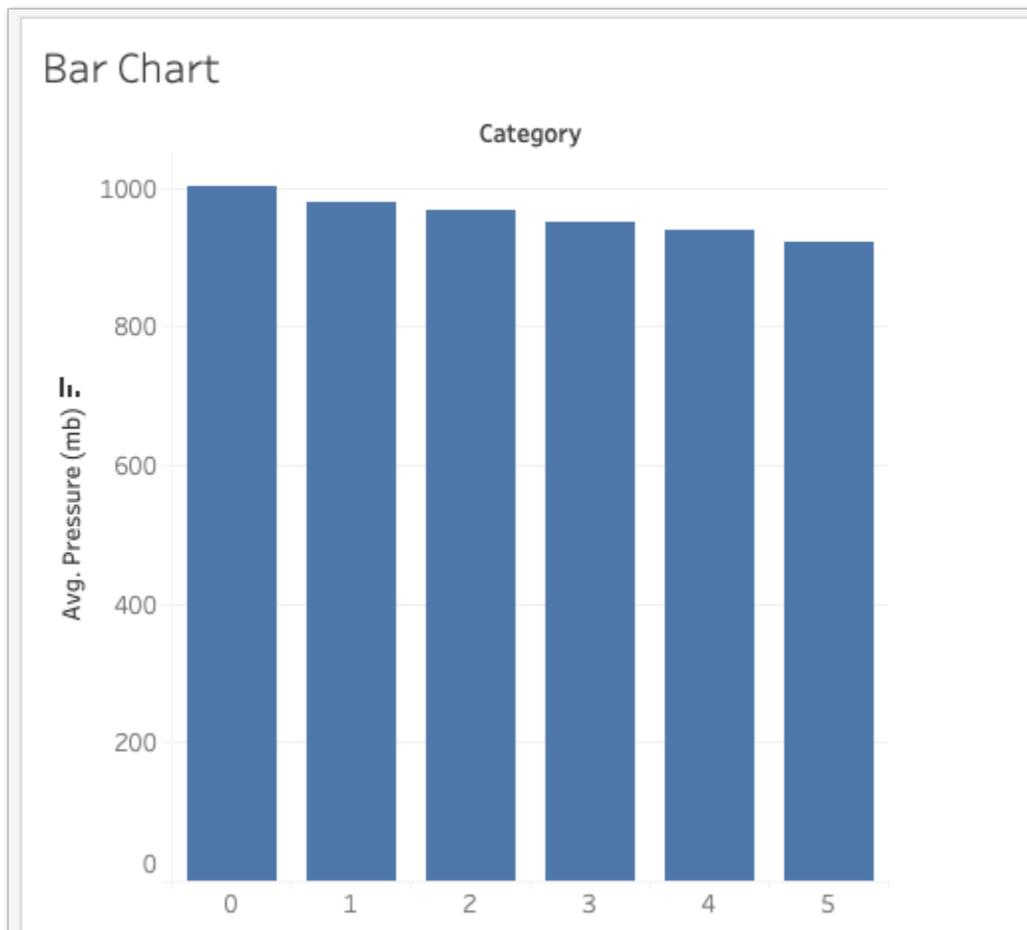


A Tableau starter workbook has been provided for this assignment. You can access the workbook titled **Tableau Fundamentals - Common Charts_starter** in the exercise files folder.

Building a Bar Chart

Question #1 - Which hurricane has the highest pressure (barometric pressure)? As a hurricane becomes stronger (increase in category), does the pressure go up or down? Using a bar chart, the average pressure can be compared based on the hurricane strength.

1. Create a new sheet and rename it **Bar Chart**.
2. Drag the **Category** dimension to the **Columns** shelf and **Pressure** measure to the **Rows** shelf.
3. Open the dropdown menu of the **Pressure** measure by right clicking the field on the **Rows** shelf.
4. Using the measure option dropdown menu, change the aggregation to average. (This process will be covered in detail in a later section).
5. Using the sort icon on the vertical axis, change the sort type to descending. Details on [how to sort](#) are available on the Tableau website.



Bar chart built with a single dimension and measure.



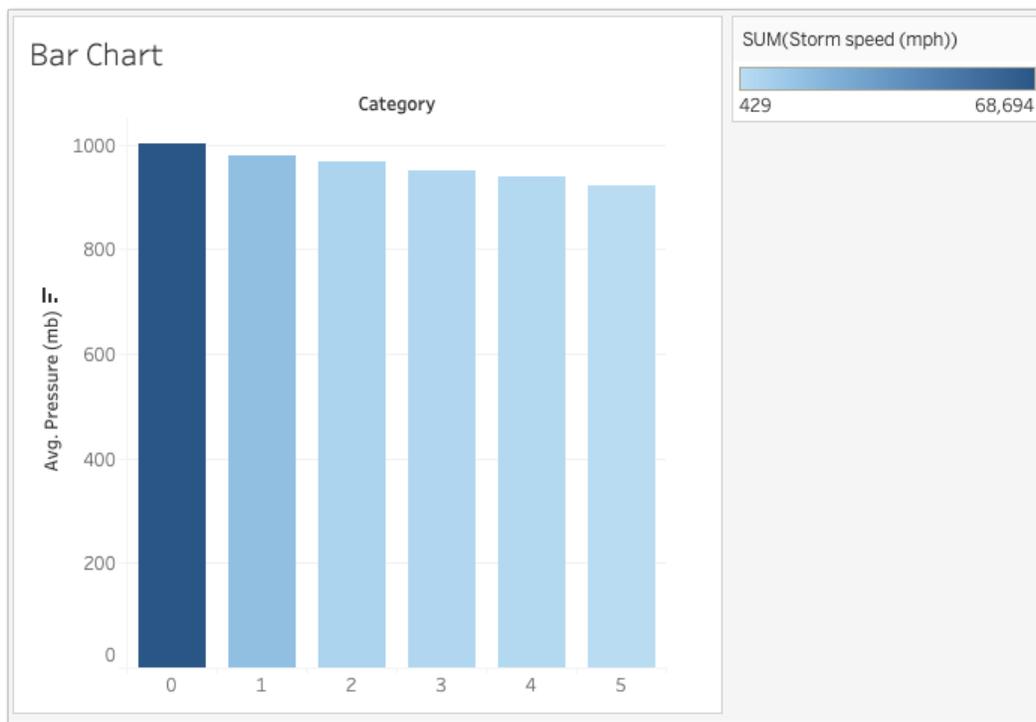


You have created a bar chart. Which category has hurricanes with the highest amount of pressure? Do you notice a trend in the data?

6. Move **Category** to the **Rows** shelf and **Pressure** to the **Columns** shelf.

The direction of the chart changes based on the location of the dimension on the shelf card.

7. Drag the **Storm Speed** measure to the **Color** mark.
8. Remove the **Storm Speed** measure from the **Marks** card and **Drag** the dimension **Date/Time** to the **Color** mark.



Bar chart with a measure added to the colors mark.

When adding a measure to the color mark, the color changes to a gradient while adding a dimension creates different colors for each category.

9. Drag additional measures to other marks.

Notice how the appearance of the bar chart changes when additional dimensions and measures are added. Think about how this can further help answer your data question. Think about how this could possibly distract or mislead your answer.





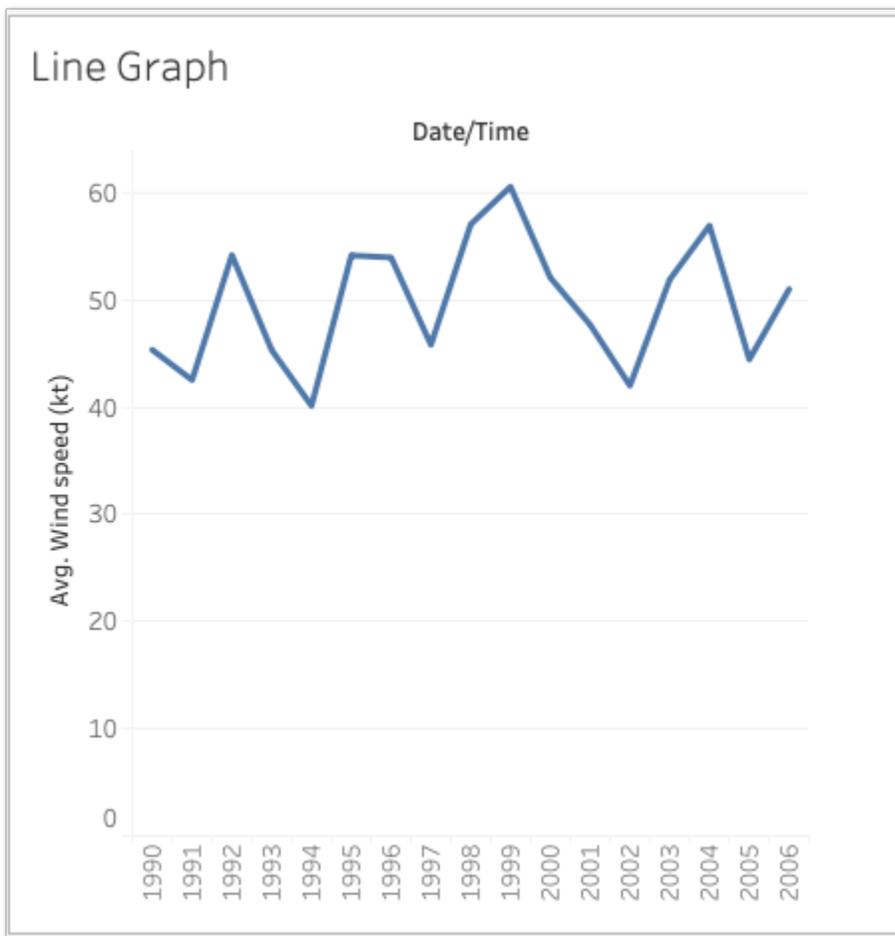
Build a Line Graph

Question #2 - Have hurricanes become stronger over the past 20 years? One indication of a hurricane's strength is its wind speed. Using a line graph, the average wind speed of hurricanes can be compared over time.

1. Create a new worksheet and rename it **Line Graph**.
2. Locate the **Date/Time** dimension and drag it to the **Columns** shelf.
3. Drag the **Wind Speed** measure to the **Rows** shelf.

You now have a line graph with a horizontal axis that contains a date (discrete date) and a vertical axis that contains wind speed. By default, the wind speed is set to a SUM aggregation.

Using this default aggregation you do not get a true sense of how fast most hurricanes were during a given year. Changing this aggregation to average will provide you with a number that represents the average speed for hurricanes during a given year.



Line graph created from a single dimension and measure.





4. Right click on the **Wind Speed** measure on the **Rows** shelf and locate the measure option on the dropdown menu.
5. Change the measure to **Average** to see the average wind speed of hurricanes per year.

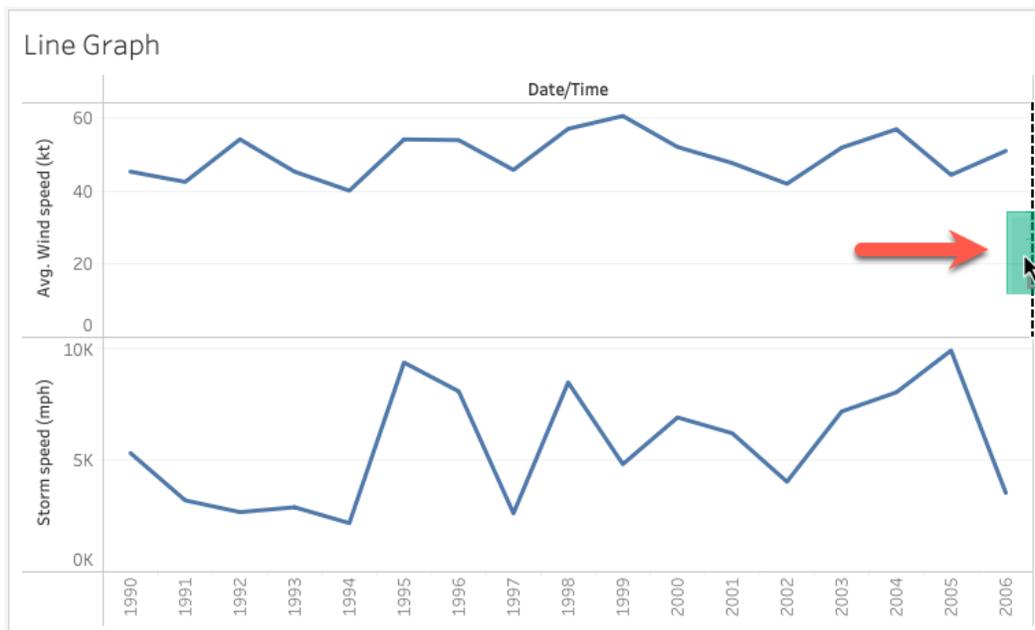
Now that you have built a line graph, let's look at how you can expand this graph into a **Dual Axis** (blended axis). Using a **Dual Axis**, you can bring in additional measures to help further answer the question being asked.

6. Locate the **Storm Speed** measure and drag it to the **Rows** shelf.
7. Change the aggregation of **Storm Speed** to **Average**.

You now have a line chart with two independent axes.

8. Drag the **Storm Speed** measure from the **Rows self** to the right side of the **Wind Speed** line chart.

You will see a black dotted line and a green bar icon indicating the creation of a dual axis chart. By default, both measures are displayed as lines/paths.



A single green bar indicates the creation of a dual axis chart.

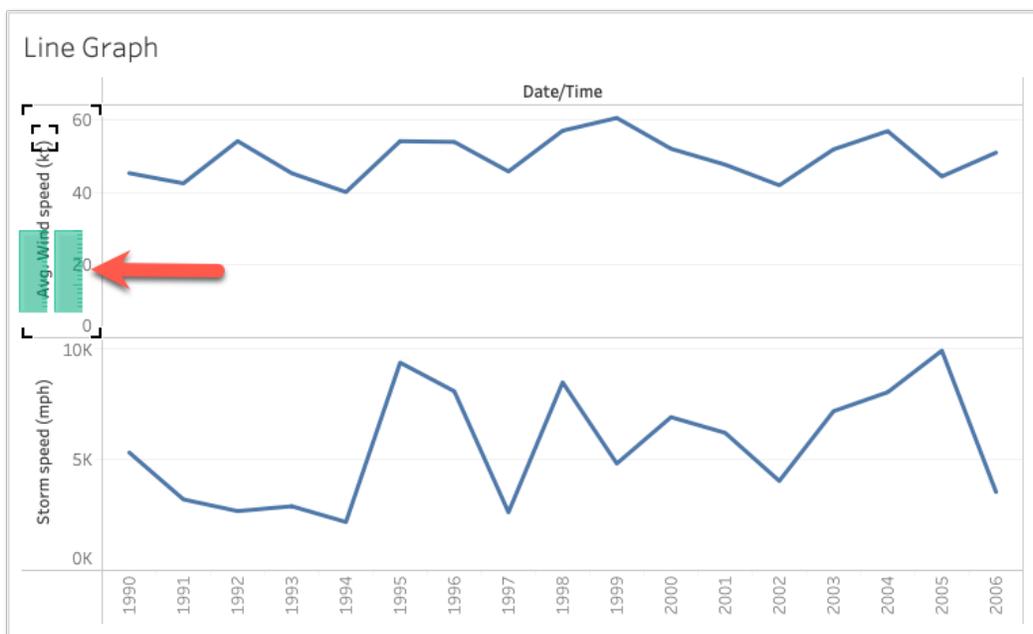
9. On the **Marks** card, click on the mark titled **AVG(Storm Speed(mph))**.



10. Change the mark type to a bar chart. (you can change the mark type using the marks type drop down menu).

Dual Axis charts are the only way to display two different mark types. This type of chart is perfect when you want to compare two measures with different scales. If you want to compare measures with similar axes, a combined axis chart is a better choice.

Creating a combined axis follows a similar process. Instead of dragging the measure to the right or top of the chart, drag the measure to the left vertical axis. A green double bar icon will appear indicating that a combined axis chart can be created.



A double green bar indicating the creation of a combined axis chart.

Build a Scatter Plot

Question #3 - As hurricanes become stronger, do they move faster or slower? Looking at a hurricane, two indications of strength are wind speed and pressure. This is different from storm speed which is how fast (forward movement) the hurricane is moving. Looking at the data, wind speed and pressure are both numerical values. Because they are both numerical values, a scatter plot is a great way to compare the relationship between speed and pressure.

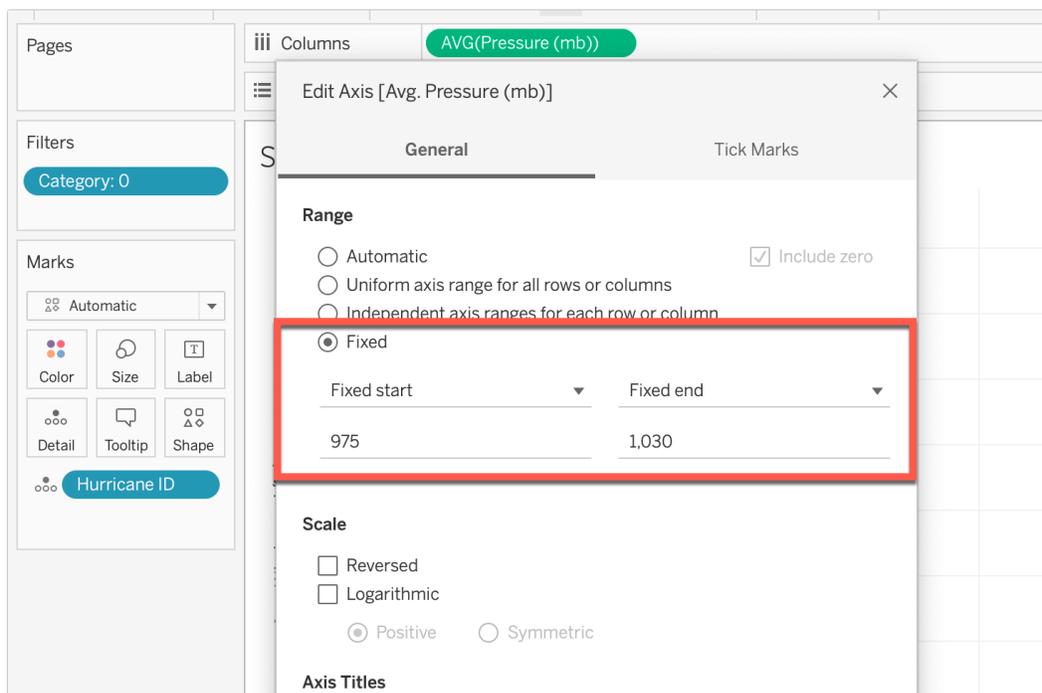
1. Create a new worksheet and rename it **Scatter Plot**.
2. Drag the **Pressure** measure to the **Columns** shelf and the **Wind Speed** measure to the **Rows** shelf.

3. Drag **Category** to the filters card and select only the **0** category.
4. Right click each field and change the aggregation to **Average**.

Each hurricane includes multiple values for each category; changing the aggregation to average will take this into account.

After adding the two measures, you now have a one-mark scatter plot. The plot is currently comparing average storm pressure to average wind speed. Using a dimension, you can expand the scatter plot into a multi-mark scatter plot.

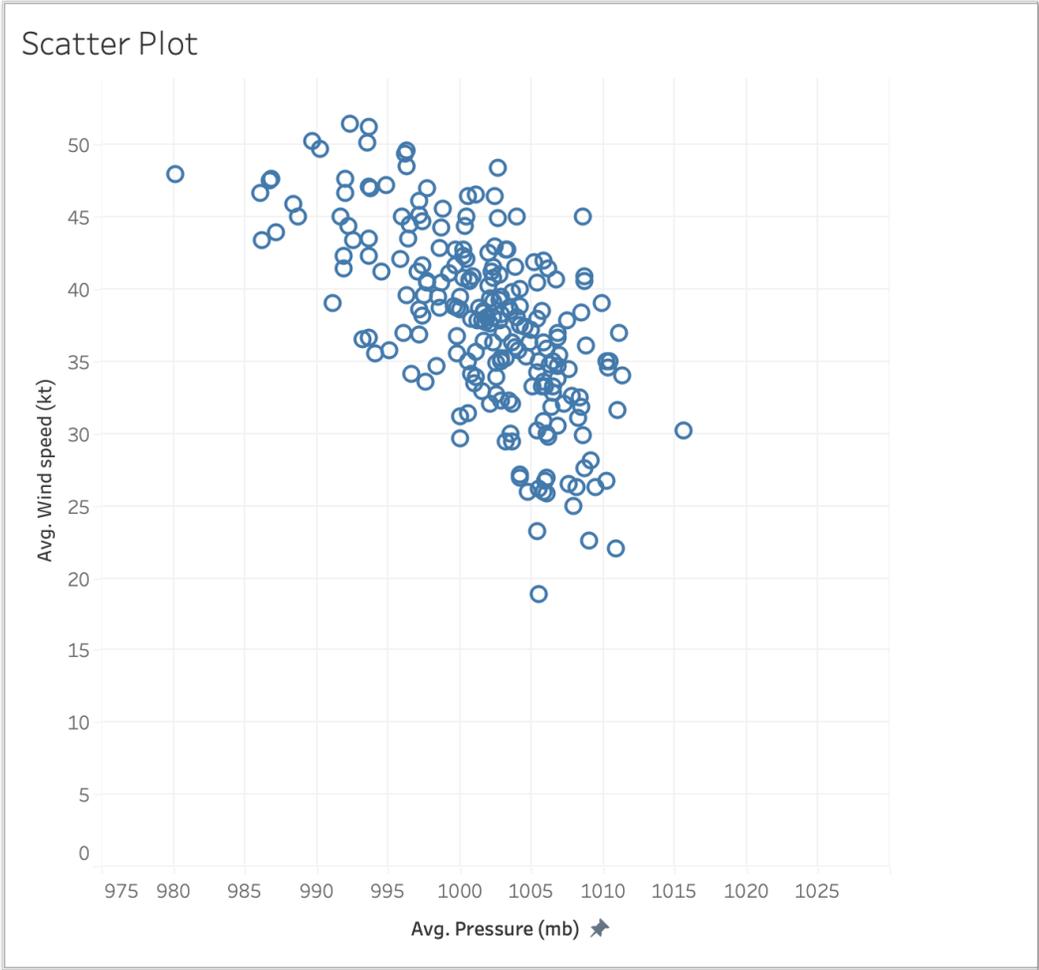
5. Drag the **Hurricane ID** dimension to the **Detail** mark.
6. Double click the **Avg. Pressure** title on the x-axis.
7. Check the fixed radio button and set the **Fixed start** to **975** and **Fixed end** to **1,030**.



Editing the axis of a scatter plot

The scatter plot now includes a mark for each hurricane. Each mark is an individual comparison of pressure vs wind speed. Hovering over each mark provides additional details about the storm. These details are provided automatically using the Tooltip mark. Looking at the plot you can see that an increase in pressure equals a decrease in wind speed.





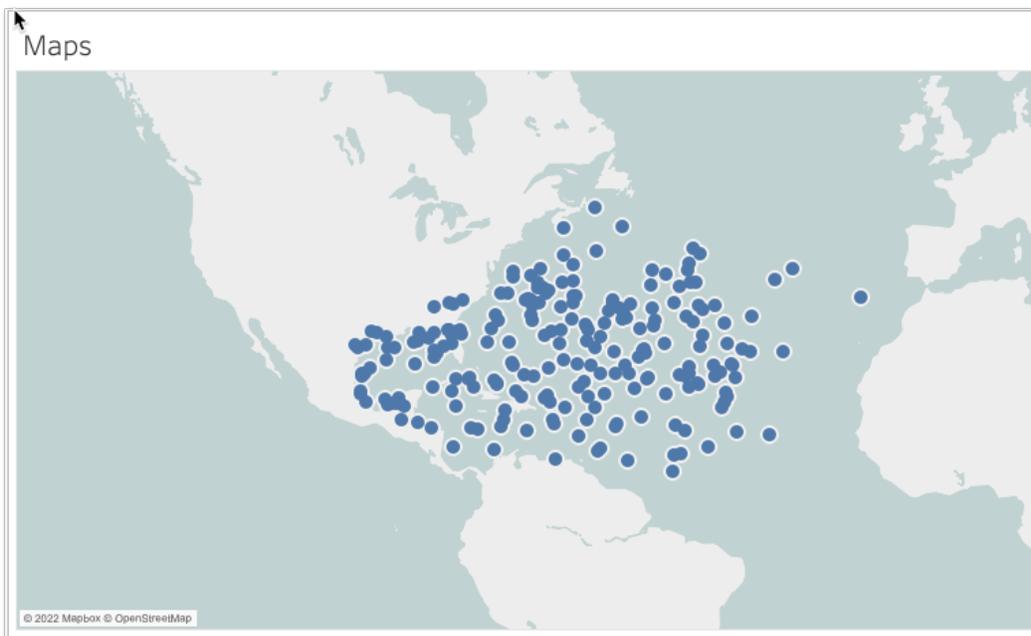
Scatter plot of hurricane wind speed and pressure



Build a Map

Question #4 - Do hurricanes commonly originate in the same location? Do hurricanes originating closer to land move slower? One important feature in Tableau is the ability to plot geographic data and answer spatial-based questions. Using the latitude and longitude data points, the location of each hurricane can be plotted on a map.

1. Create a new worksheet and rename it **Maps**.
2. Locate the **Latitude** and **Longitude** measures on the **Data** pane. Double click each measure to create a one-mark map.
3. Drag the dimension **Hurricane ID** to the **Detail** mark.



Proportional symbol map

Tableau has now plotted the location of each hurricane based on the Latitude and Longitude provided in the data set. Looking at the map (a proportional symbol map), you can see that hurricanes in the data set originated in the Gulf of Mexico and Atlantic Oceans regions.

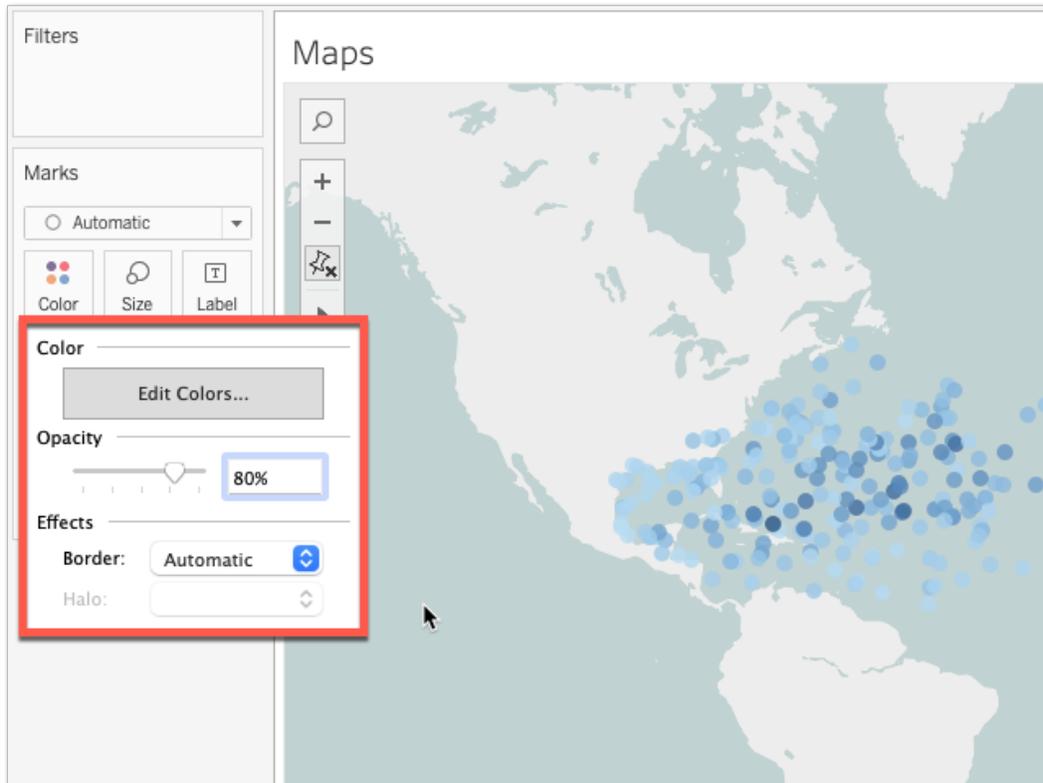
Similar to scatter plots, additional dimensions can be added to the map to further expand the level of detail and analysis of the map.

4. Drag the **Wind Speed** measure to the **Color** marks card.



Each mark is now a shade of blue and a legend has been added to the left side of the view. Notice how the color uses a gradient (light blue to dark blue) and not a set of individual colors. If the field was a dimension, individual colors would have been added based on each individual category.

5. Right click on the **Wind Speed** measure and change aggregation to **Average**.
6. Click on the **Color** mark and change the **Opacity** to 80%.



Color mark options from the Marks card.

Looking at the map, historically it appears that hurricanes with higher average wind speed (darker blue color) originate further away from land than those with lower average wind speeds.

Section Three

Sorting and Grouping

Plan and Objectives

Introduction

This module will explore how you can use Tableau to expand and/or limit the data shown in a view. Starting with filters, this module will explore how to limit what data is shown in the view. Following filters, this module will explore how to group data into new fields, how to drill down in your data, and how to change the name of certain fields.

Objectives

At the end of this module, students will be able to:

- Order data correctly to limit the amount shown in a view using Tableau Filters
- Identify how to change the data in a Tableau view using sorting and alias
- Produce new data fields using groups and sets

Additional Reading/Resources

- [Filtering data in Tableau](#)
- [Grouping data in Tableau](#)
- [Creating a Top N Filter](#)
- [Creating Sets](#)
- [Creating Alias](#)
- [Creating Hierarchies](#)

Walkthrough Assignment

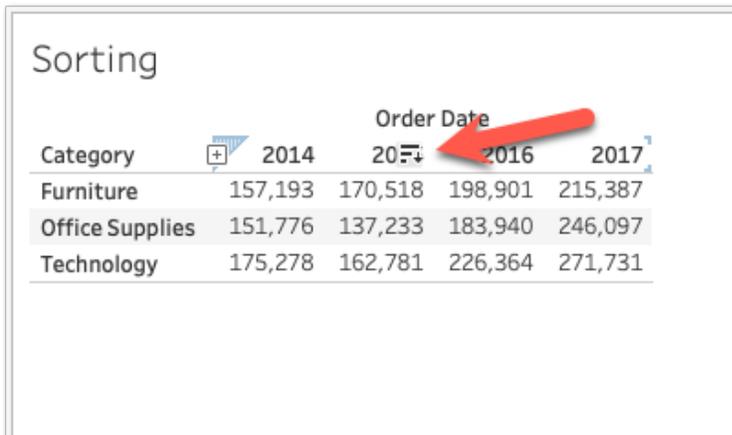
Understanding how to filter, group, and sort your data is key when developing visualizations. Using Tableau and the Superstore data set, complete the guided assignment. Using these prompts, explore the different key elements of filtering, grouping and sorting.

*A Tableau starter workbook has been provided for this assignment. You can access the workbook titled **Tableau Fundamentals - Sorting and Grouping_ starter** in the exercise files folder.*



Sorting

1. Open the starter workbook and navigate to the **Sorting** worksheet.
2. Hover over the headers **Order Date** and **Category** until you see the sort icon appear.
3. Click the icon to cycle through the different quick sort options.
4. The first click creates a **descending** sort, the second click creates an **ascending** sort, and the third click **removes** the sort option.



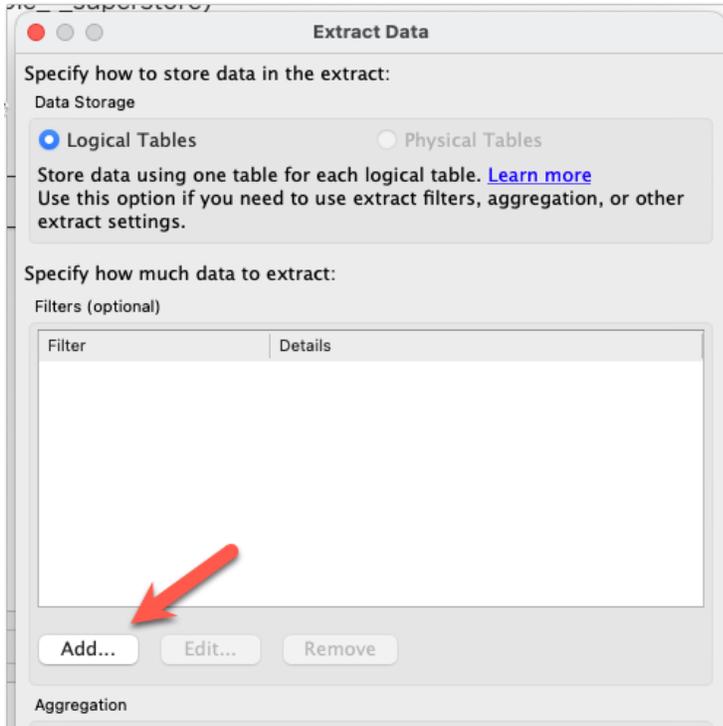
Category	Order Date			
	2014	2015	2016	2017
Furniture	157,193	170,518	198,901	215,387
Office Supplies	151,776	137,233	183,940	246,097
Technology	175,278	162,781	226,364	271,731

Tableau sorting icon

Notice that when a sort is enabled, the sorting icon will appear at the right corner of the field on the Rows and Columns shelf. Looking at the Order Date 2015 column in descending order, furniture had the highest amount of sales.

Filters

1. Navigate to the **Data Source** tab and click the **Extract** radio button in the top right corner.
2. Click the **Edit** button to the left of the radio button to open the **Extract Data** dialog box.



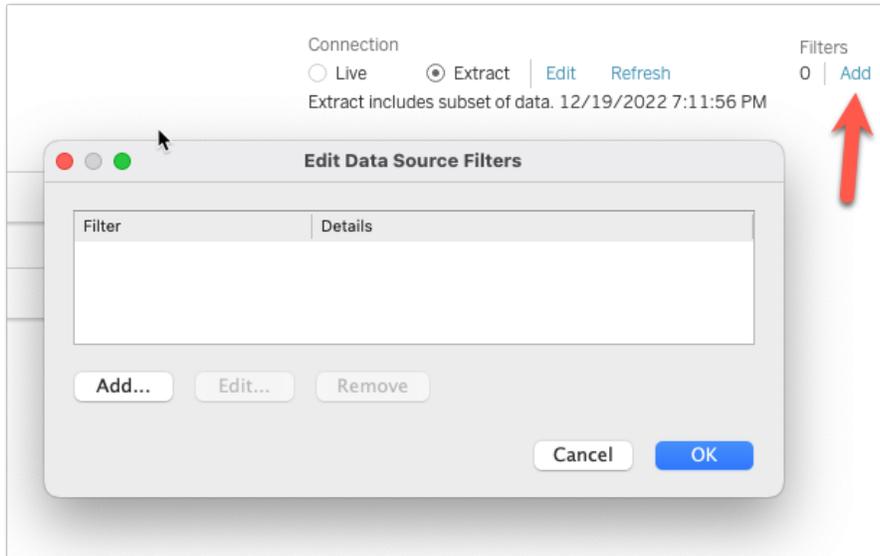
Filter option on the Extract Data dialog box.

3. In the **Filters** section, click the add button and select the dimension **Category** and check the boxes for **Furniture** and **Office Supplies**.
4. Close the **Extract Data** dialog box and open a worksheet.

Before the sheet will open, a new extract will process and a copy will be saved on your local machine.

5. Create a new worksheet and rename it **Filters**.
6. Drag the dimension **Category** to the **Rows** shelf to see what values are filtered out of the view.
7. Navigate back to the **Data Source** tab and click the **Add** button in the top right corner under the **Filters** section.



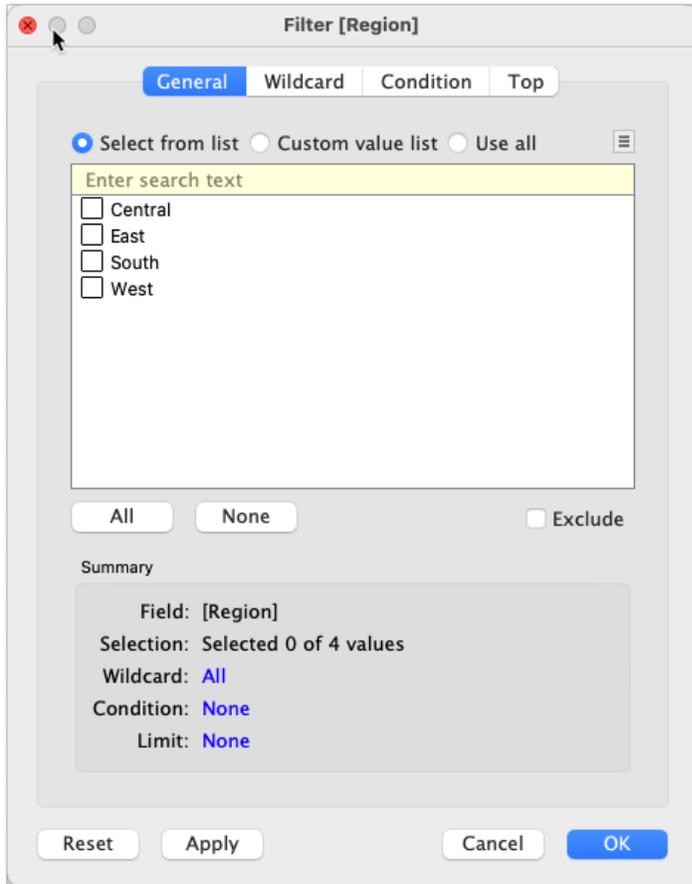


Access to the *Edit Data Source Filters* dialog box.

8. Using the **Edit Data Source Filters** dialog box, click the **Add** button.
9. Select the dimension **Region** and check the boxes for **Central**, **East**, and **South**.
10. Navigate back to the new tab and drag the **Region** dimension to the **Rows** shelf.

After creating a Data Source Filter, an extract was not created. While these filters seem similar, the major difference is that an Extract Filter will remove fields before they are loaded into Tableau. After exploring how these types of filters work, navigate back to the data source and remove the filters.

11. Navigate to the **Filters** worksheet and drag the **Regions** dimension to the **Filters** card.
12. After the **Filter** dialog box appears, check the boxes for **Central**, **South**, and **West**.



Filter dialog box when a dimension is added to the Filter shelf.

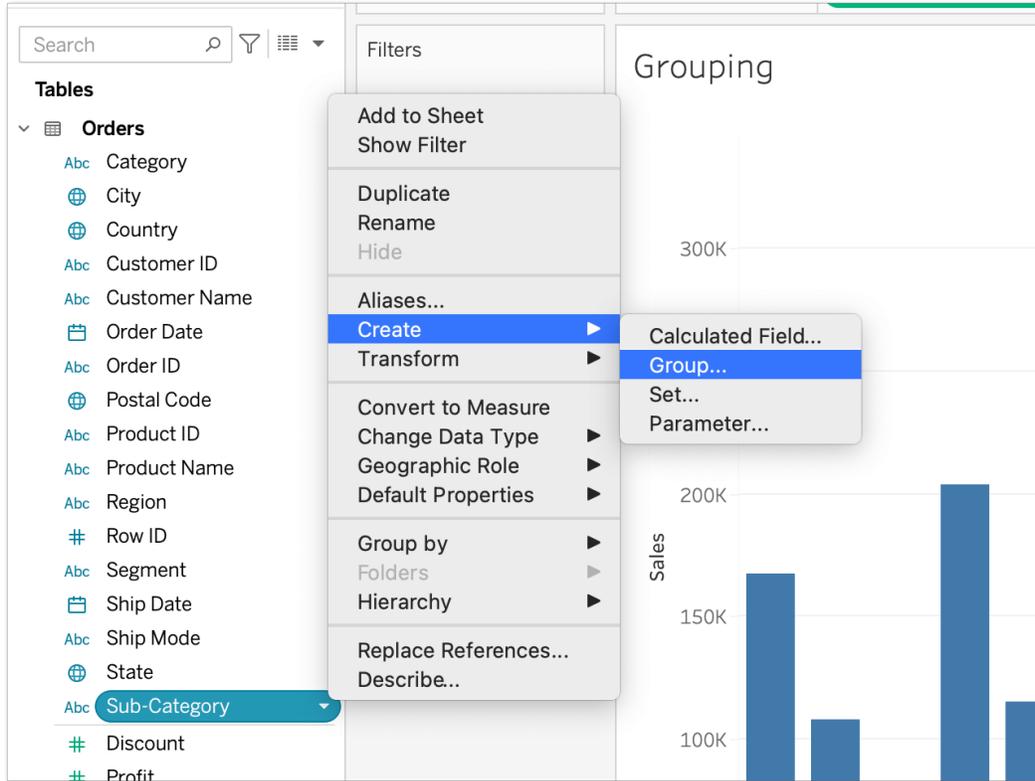
After closing the dialog box, notice the values displayed on the view are reduced. Applying the filter has reduced these values. Right click the Region dimension and click the edit filter option. Click through the different filter options to see how it affects the view. Remove Region from the filter shelf.

Drag a measure and then a date to the Filters shelf. Click through the different options to see how it affects the view.

Grouping

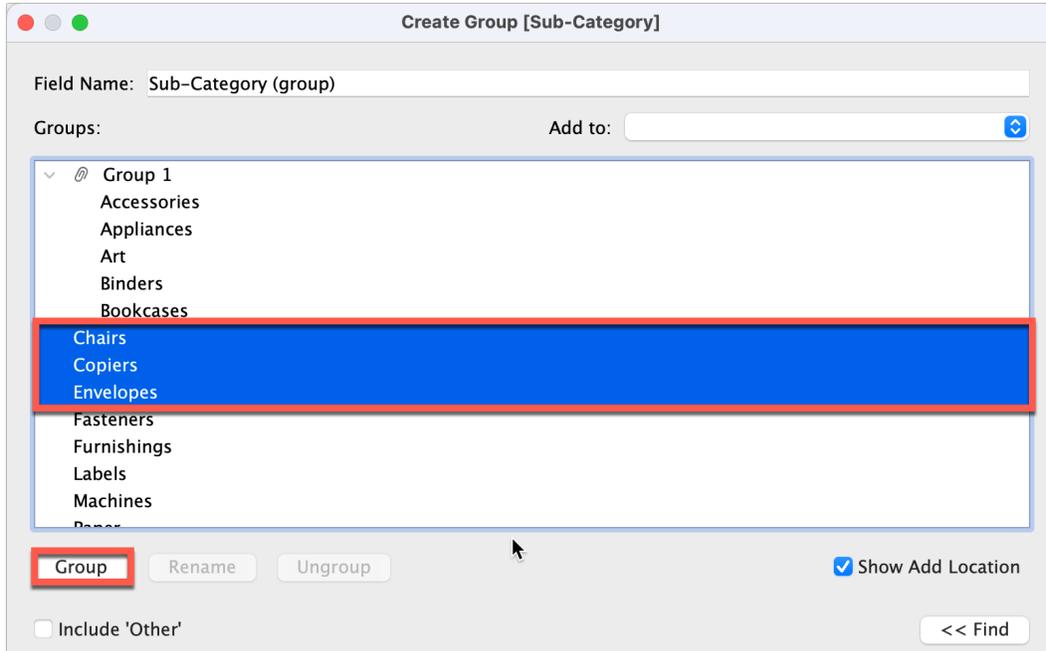
1. Create a new worksheet and rename it **Grouping**.
2. Drag the **Sub-Category** dimension to the **Columns** shelf and the **Sales** measure to the **Rows** shelf to create a new bar chart.
3. On the **Data pane**, right click the **Sub-Category** dimension and click create a new group under the create option on the dropdown menu.





Group option from the Data pane dropdown menu

4. Holding down the **ctrl/cmd** button select several members of the **Sub-Category** and click the **Group** button.
5. After the group is created, double click the title and rename it to **Group 1**.
6. Repeat the process until all members are included in a group. You should have at least 3 groups.



Group creation process

7. Replace the **Sub-Category** dimension with the newly created **Sub-Category (group)** dimension.

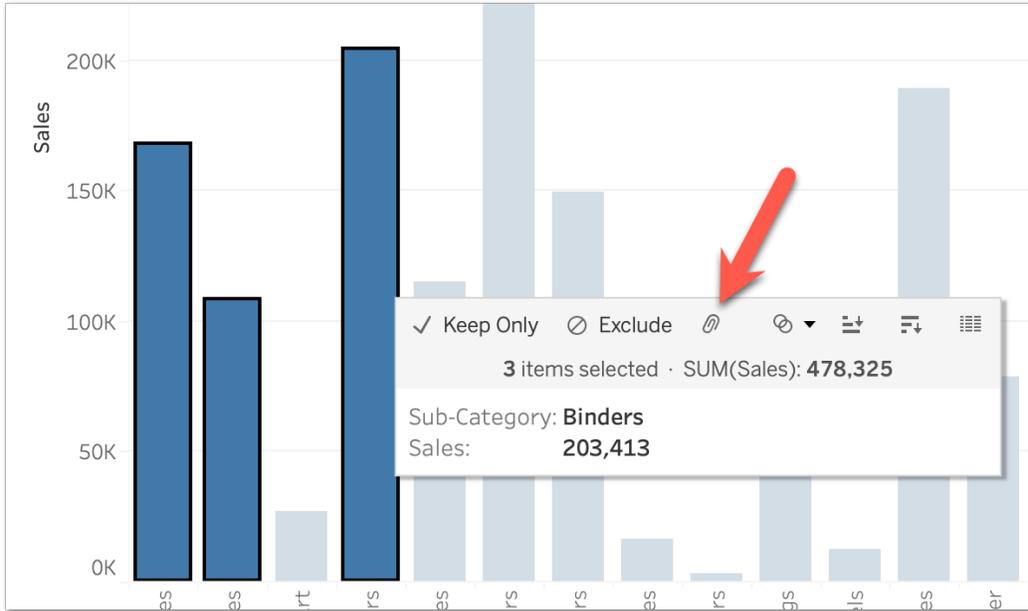
The newly created dimension will have the word “group” in parenthesis next to the fields title on the Data pane. The paper clip icon also appears next to the title indicating a group has been created.

After swapping the dimension, you only have 4 marks on the view. Notice how the sub-category title also includes the word “group” in the title. Hit the back button on the navigation bar to reset the graph to its original state.

8. On the view, hold down the **ctrl/cmd** button and select multiple marks on the view.
9. Right click on one of the marks and select the **Group** option on the drop down menu.

Along with creating a group using the right click method, groups can be created by clicking the paper clip icon on the Tooltip icon that appears when you hover over a selected group of marks.



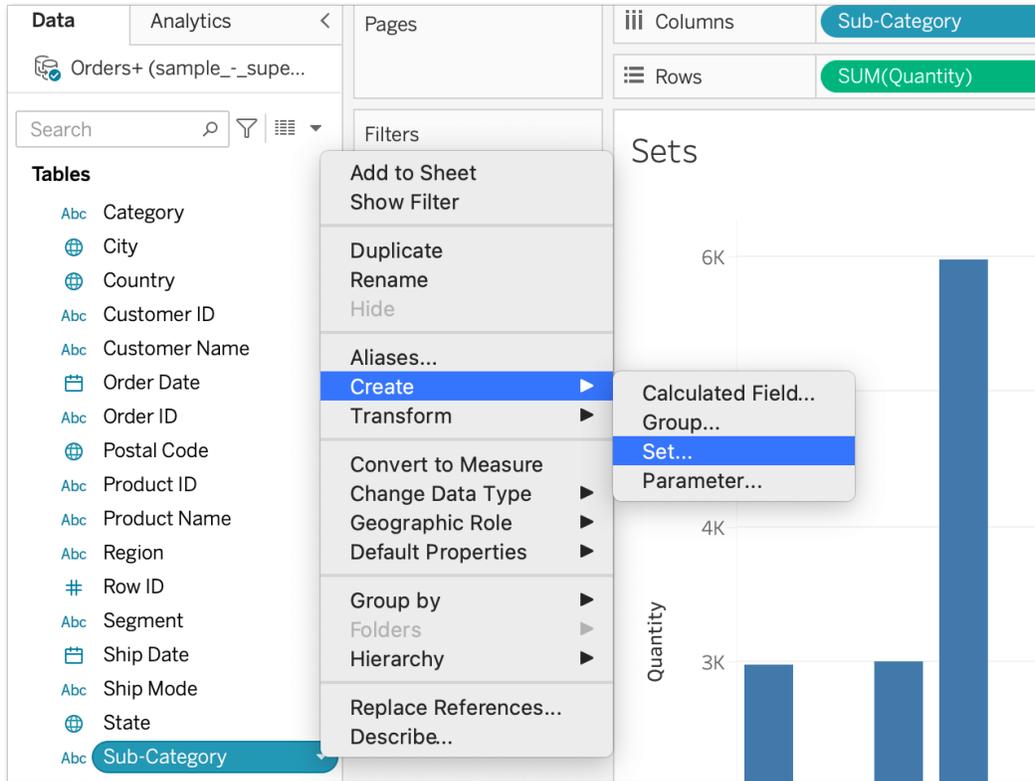


Group icon on the toolbar is indicated by a paper clip icon.

After creating a group on the view, the members are automatically combined on the bar chart. The new Sub-Category is added to the color mark. Right clicking on that group provides the option to further edit the group.

Sets

1. Create a new worksheet and name it **Sets**. Drag the **Sub-Category** dimension to the **Columns** shelf and the **Quantity** measure to the **Rows** shelf.
2. On the **Data pane**, right click the **Sub-Category** dimension and create a new set under the create option on the dropdown menu.



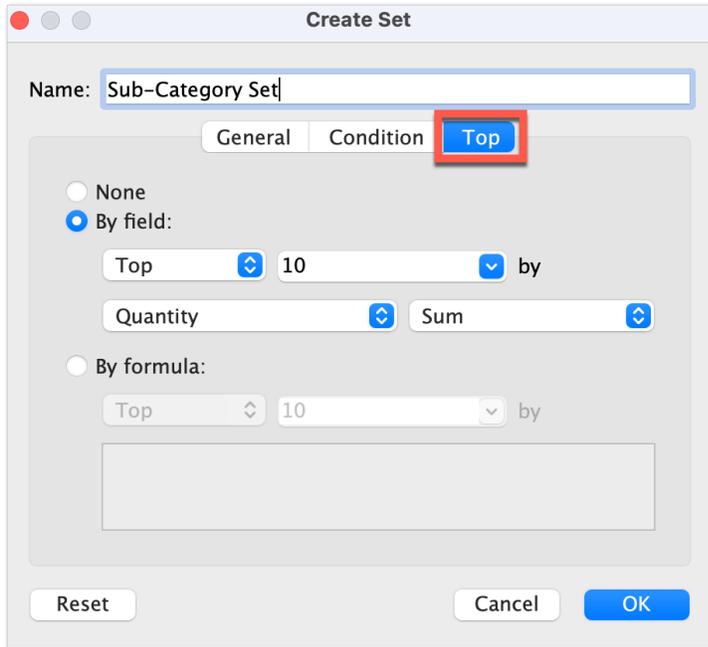
Set creation option from the Data pane dropdown menu.

3. Click the **Top** tab and check the box **By** field.
4. Set the **Top to 10** and **By** to **Quantity & Sum** and click **OK**.

A new dimension is added to the Data Pane with the word “set” in it. An icon of two interlocking circles next to the title indicates a set has been created.

5. Drag the newly created set to the **Colors** mark.



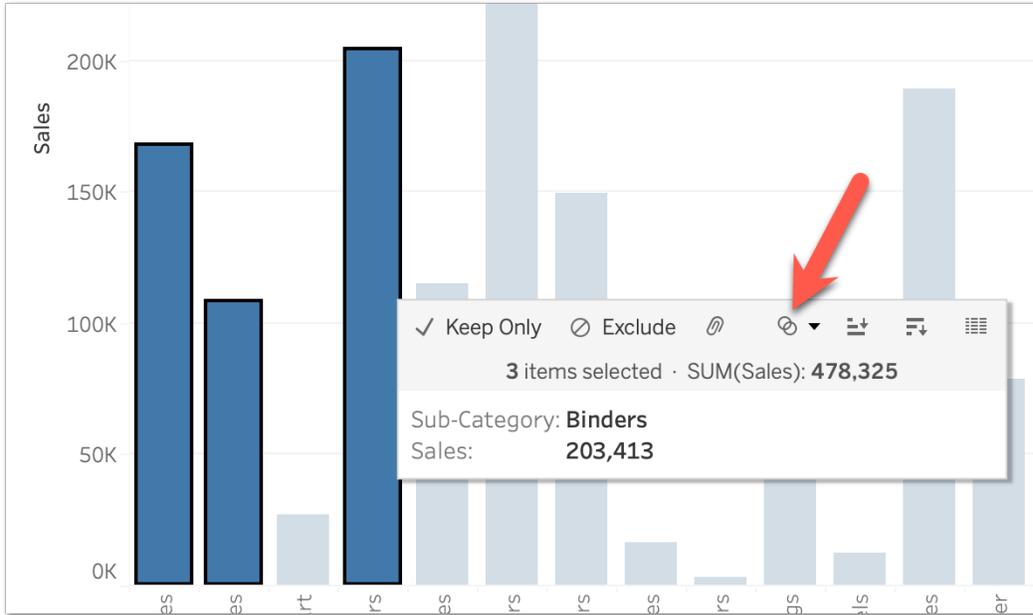


Create set Top option

After adding the set to the Colors mark, you now have a bar chart with two different color marks. On the right side, a legend has been added with the words In and Out. Sets help us ask questions about a subset of data. Looking at this chart, the In is showing all marks who meet the criteria of the By field parameters.

Using the Data pane creates a dynamic set that will update with any update to the data source.

6. Remove the set from the **Colors** mark.
7. Hold down the **ctrl/cmd** button and select multiple marks on the view.
8. Highlight the selected marks to open the **Tooltip** menu.
9. Click the **interlocking circle icons** to create a new manual set.
10. Review the set member in the dialog box and click **OK**.



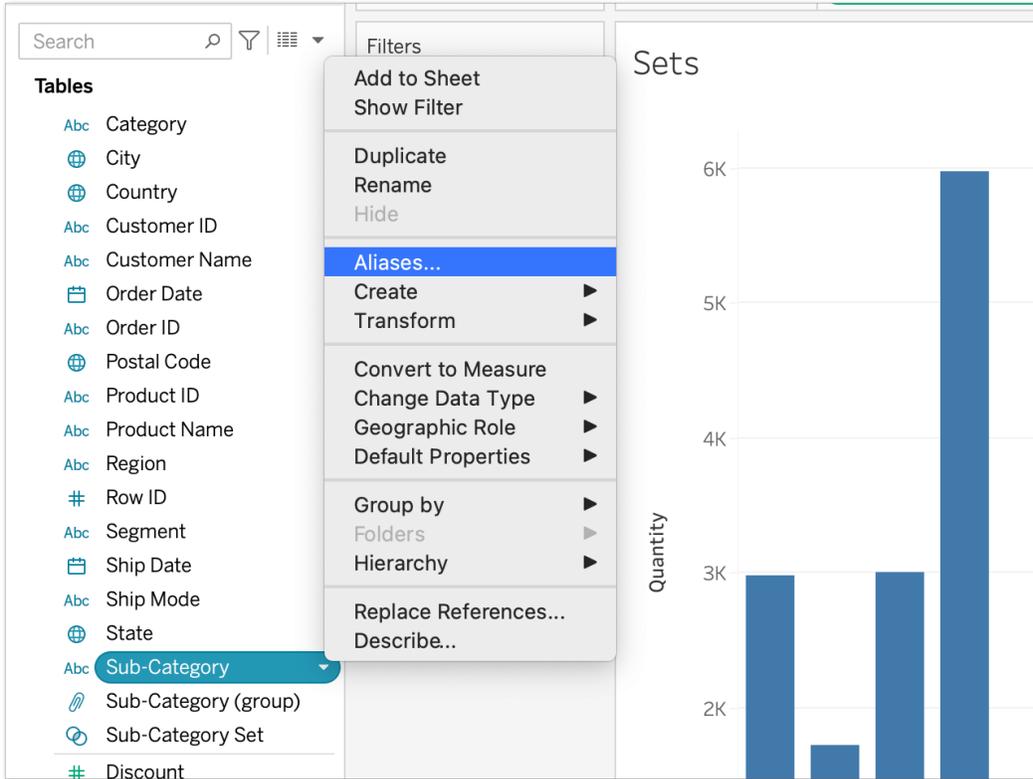
Set icon on the toolbar is indicated by two interlocking circles.

This new set is a manual or fixed set and will not update when the data source is updated. Manual or fixed sets are great when you want to control what members are included. Similar to groups, manual or fixed sets also can be created using the right click method on a mark.

Alias

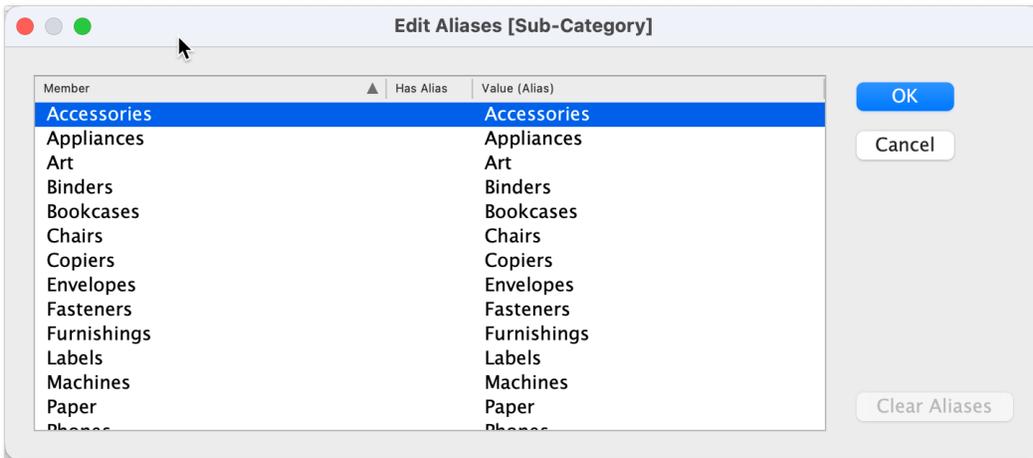
1. Create a new worksheet and rename it **Alias**.
2. Drag the **Ship Mode** dimension to the **Columns** shelf and **Sales** measure to the **Rows** shelf.
3. On the **Data** pane, right click the **Sub-Category** dimension and create a new alias using the **Aliases** option on the dropdown menu.





Alias creation option from the Data pane dropdown menu.

4. Click on the **Value (Alias)** options and change the name of each member.



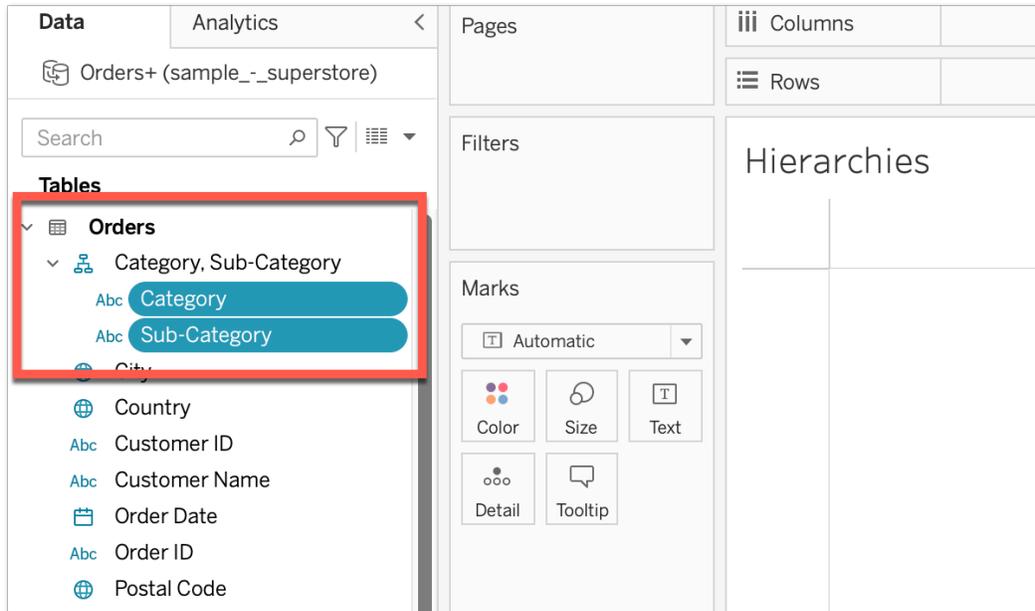
Edit Alias menu from the Data pane option

5. Alternatively, right click on one of the mark labels and click the **Edit Alias** option and change alias name.

Notice that creating an alias only affects the members of that field and does not affect the name of the field on the Data pane.

Hierarchies

1. Create a new worksheet and rename it **Hierarchies**.
2. Drag the **Sub-Category** dimension on top of the **Category** dimension.



Hierarchy created on the Data pane

3. Rename the hierarchy **Categories**.
4. Drag **Categories** to the **Columns** shelf and **Sales** to the **Rows** shelf.
5. Click the **plus (+)** icon on the **Categories** field to drill down in the hierarchy.
6. Click the **minus (-)** icon on the **Categories** field to close the drill down.

Creating hierarchies allows you to drill down deeper in your visualization.



Calculations

Plan and Objectives

Introduction

This module explores how Tableau uses calculations to transform values from a data source. The module starts with exploring how totals and basic calculations function inside Tableau. Following this content, the module explores how to create custom calculations using string and date fields. The final section of the module explores how table calculations can quickly be applied to measures on a view.

Objectives

At the end of this module students will be able to:

- Recognize how to transform values in Tableau using calculations
- Create new data fields using Tableau calculated fields and functions
- Choose the proper table calculation to quickly transform values on a view

Additional Reading/Resources

Use the links below to expand on the content discussed in class and in the assignment. Each article includes practice walkthroughs. Use the provided in-class activity to further practice what was discussed in the presentation.

- [How Tableau Calculations work](#)
- [Types of Calculations](#)
- [Aggregate Functions](#)
- [String Functions](#)
- [Date Functions](#)
- [Quick Table Calculations](#)



Walkthrough Assignments

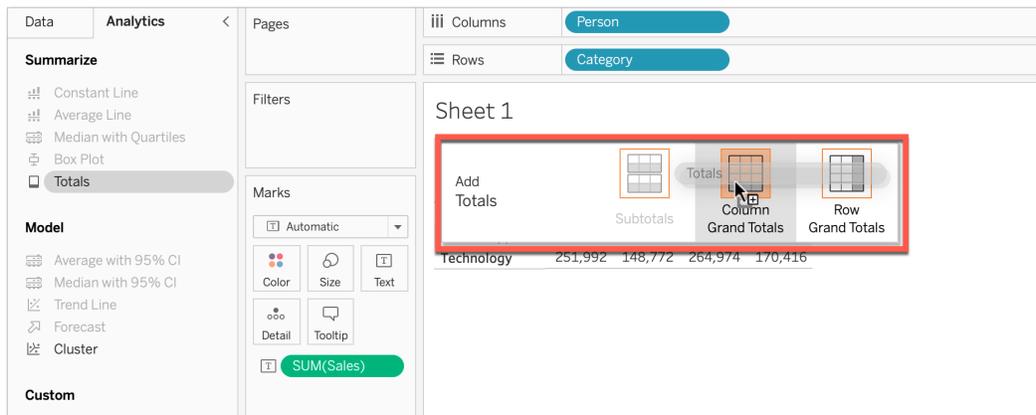
Calculations play a key role in developing visualizations with data beyond what is provided in your data source. This process allows you to create new data fields and additional insights that normally would not be available. Follow along with the answers to the questions below to learn more about calculations and totals.

A Tableau starter workbook has been provided for this assignment. You can access the workbook titled **Tableau Fundamentals - Calculations_starter** in the exercise files folder.

Totals

Question #1 - Which Manager (person) had the highest total sales? Which year had the highest total sales?

1. Open the starter workbook and create a new worksheet. Rename the sheet **Totals**.
2. Drag the **Person** dimension to the **Columns** shelf and **Category** to the **Rows** shelf.
3. Drag the **Sales** measure to the **Text** mark.
4. Using the **Analytics** pane, drag **Total** to the view.
5. Select **Column Grand Totals** on the **Add Totals** pop up menu.

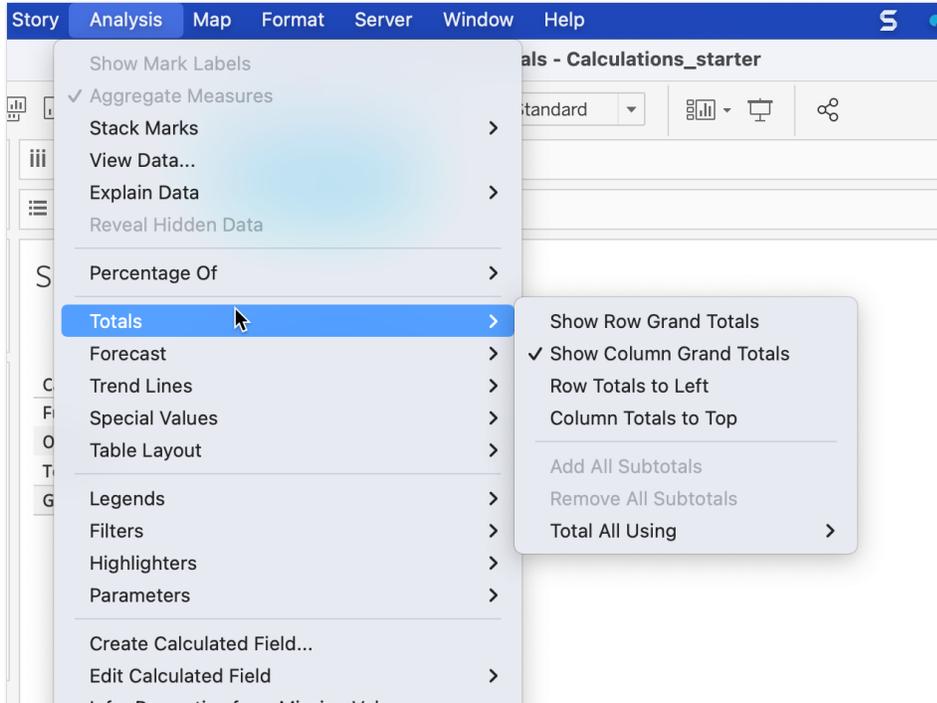


Totals option available from the Analytics pane

Looking at the totals, you can see that Anna Andreadi had the largest amount of total sales.

6. Open the **Analysis** dropdown menu from the navigation bar and open the **Totals** sub-menu.
7. On the **Totals** sub-menu, click **Show Column Grand Totals** to hide the grand totals.
8. On the same menu, click **Show Row Grand Totals** to reveal the grand totals for each year.





Totals option available on the Analysis dropdown menu.

Using the Analytics pane or Analysis menu provides the option to add grand totals. The Analysis menu provides the additional option of removing totals already added to the view. The Analysis menu also provides additional options such as choosing the location of the totals. Looking at the results, you can see that 2017 had the highest total sales.

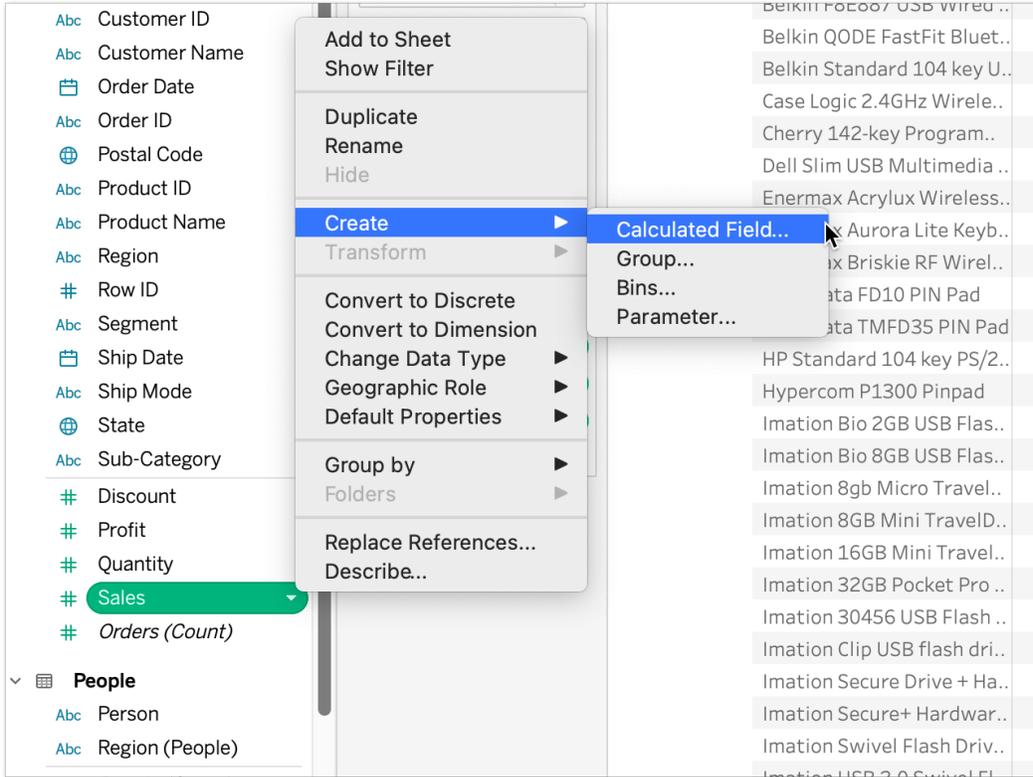
Calculated fields

Question #2 - Which appliance has the largest cost per unit?

1. Create a new worksheet and rename it **Calculations**.
2. Drag the **Sub-Category** dimension and **Product Name** dimension to the **Rows** shelf.
3. Drag the **Sales**, **Profit**, and **Quantity** measures to the **Columns** shelf.
4. Open the **Show Me** tab and select **Text Tables** in the top left corner.
5. Reorder the measure values to appear in the order **Sales, Profit, Quantity**.

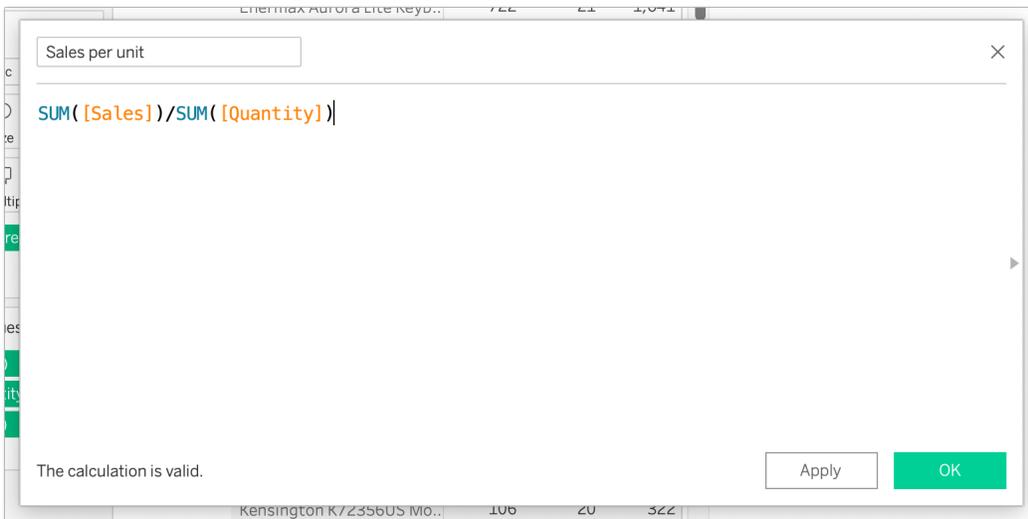
Using calculated fields, the Sales and Profit can be broken down per unit. Breaking these down by unit will help us determine the production cost per unit sold.

6. On the **Data pane**, right click on the **Sales** measure create a new **Calculated Field** using the **Create** option on the dropdown menu.



Calculated Field option from the Data pane dropdown menu.

7. Rename the calculated field **Sales per unit**.
8. In the text box, add the following equations **SUM([Sales])/SUM([Quantity])**.
9. Click **OK** to create a new calculated field.



Calculated Field calculation editor





As you type, Tableau automatically pulls in items from the Data pane along with pre-populated functions. A successfully pulled in item will turn orange and will be enclosed by two brackets. A successful calculation will include the “This calculation is valid” statement in the bottom left corner of the text box.

Notice that the above calculation includes aggregations in the calculated field. By default, Tableau applies an aggregation to measures that are added to a view. While this feature is beneficial, it is not always what you need.

In this case, the aggregation should take place before the measures are added to view. This prevents an additional aggregation to be applied when the measures are added to the view. Tableau indicates this by adding AGG before the measure name under Measure values card. Not adding this aggregation creates a disaggregation calculated field. Disaggregation is great if you decide you want to see all of the marks in the view at the most detailed level of granularity. Disaggregating your data means that Tableau will display a separate mark for every data value in every row of your data source.

10. Create another calculated field off the **Profit** measure.
11. Rename the field **Profit per unit**.
12. In the text box, add the following equation **SUM([Profit])/SUM([Quantity])**.
13. Check that the calculation is valid and click **OK**.
14. Drag **Sales per unit** and **Profit per unit** to the **Measure Values** card next to the view.
15. Reorder the measure values into the following order: **Sales, AGG(Sales per unit), Profit, AGG(Profit per unit), Quantity**.

The text table now includes the average cost of each item sold and the average profit the Superstore is making per unit sold. Using these calculations, you can create a new calculation to determine the average cost per unit sold.

16. Create a new calculated field and name it **Cost per unit**.
17. In the text box, add the following equation **[Sales per unit] - [Profit per unit]**.
18. Check that the calculation is valid and drag it to the **Measure Values** card.
19. Right click the new calculation and change the measure to average.

Looking at the updated text table, the Hoover shoulder vac has the highest average cost per unit sold. Calculated fields are a great resource when you need to expand or create new data fields that were not initially included in your original data source.

String Functions

Question #3 - Using the Product ID, how many tables were sold?





1. Create a new worksheet and rename it **String Calc**.
2. Create a new calculated field and name it **Product Split**.
3. In the calculation editor, add the following equation **SPLIT([Product ID], '-', 2)**.

Reference the image in the previous section on how to use the calculation editor.

Using the string function, we are creating a new dimension that is splitting and pulling out the Sub-Category ID from the Product ID. Using a string function is a great way to create sub categories of items from your original data source.

4. Drag the new calculated field to the **Rows** shelf.
5. Drag the **Sales** measure and the **Quantity** measure to the view.

Looking at the product TA (using the Data Source you can identify what sub category TA is associated with), the total quantity sold was 1,241 items.

String functions are a great example of how to create additional/new data fields. The [Tableau website](#) has additional examples on how string functions work.

Date Functions

Questions #4 What is the average order processing time?

1. Create a new worksheet and rename it **Date Calc**.
2. Create a new calculated field and name it **Order process time**.
3. In the text box, add the following equation **DATEDIFF('day',[Order Date],[Ship Date])**.

Using the DATEDIFF function, you can determine the difference between two dates. For this equation, you are looking at how many days have lapsed from the date the product was ordered to the date it was shipped out. Date functions are a great example of how to create additional/new data fields. The [Tableau website](#) has additional examples on how string functions work.

4. Drag the **Category** and **Sub-Category** dimensions to the **Rows** shelf.
5. Drag the **Order process time** calculated field to the view.
6. Right click on the measure and change the measure type to average.

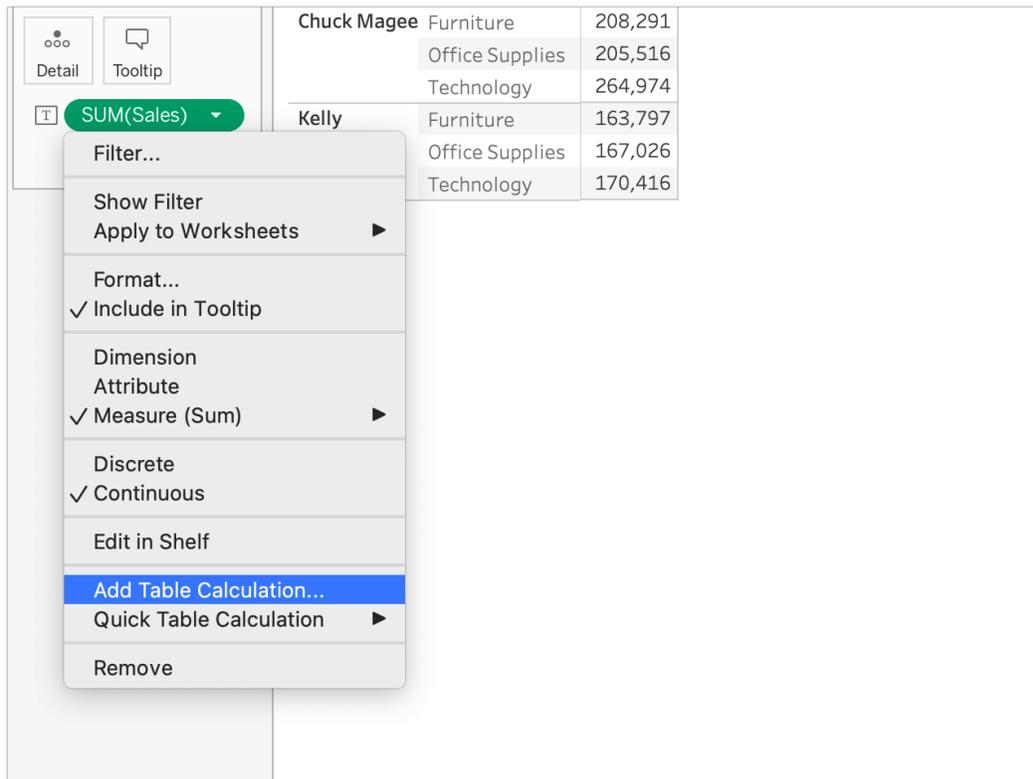
Looking at the text table **Sub-Categories**, most orders are processed within 4 days.



Table Calculations

Question #5 What area is each sales person most successful in selling?

1. Create a new worksheet and rename it **Table Calc**.
2. Drag the **Person** and **Category** dimensions to the **Rows** shelf.
3. Drag the **Sales** measure to the view.
4. Right click on **Sales** and select the **Add Table Calculations** option from the dropdown menu.



The screenshot shows a Tableau worksheet with a table of sales data. The table has columns for Salesperson, Category, and Sales Amount. A context menu is open over the 'SUM(Sales)' measure, with 'Add Table Calculation...' selected.

Salesperson	Category	Sales Amount
Chuck Magee	Furniture	208,291
	Office Supplies	205,516
	Technology	264,974
Kelly	Furniture	163,797
	Office Supplies	167,026
	Technology	170,416

Table Calculations can be accessed from the Marks card.

5. Change the calculation type to **Percent of Total**.
6. Change **Compute Using to Pane (down)**.
7. Click on the **X** in the top right corner to close the menu.
8. If needed, use the right click method on the **Sales** measure to open the menu again.

Person	Category	
Anna Andreadi	Furniture	
	Office Supplies	-31,759
	Technology	31,139
Cassandra Brandow	Furniture	
	Office Supplies	8,353
	Technology	23,121
Chuck Magee	Furniture	
	Office Supplies	-2,775
	Technology	59,458
Kelly Williams	Furniture	
	Office Supplies	3,229
	Technology	3,390

Table Calculation
Difference in Sales

Calculation Type
Difference From

Compute Using

- Table (down)
- Pane (down)
- Pane (across then down)
- Pane (down then across)
- Cell

Specific Dimensions

- Category
- Person

At the level

Relative to Previous

Show calculation assistance

Table Calculation dialog box

Using Table Calculations, you can apply quick calculations to your view without having to alter/update your database. Using the Percent of Total calculation you can see what percentage each category relates to the overall sales of the sales person.

Notice that you chose Pane and not Table for the direction of the calculation. This direction can play a major role in how the data is displayed. Tableau will highlight the data in yellow to display what direction the calculation is going.

Along with using the Table Calculation menu, you can also perform the same task using the Quick Table Calculation feature.

9. Right click on the **Sales** measure and select **Clear Table Calculations**.
10. On the same menu, click **Percent of Total** from the **Quick Table Calculation** option.
11. By default, the direction is set to **Table(down)**.
12. Right click on the **Sales** measure and click **Pane (down)** from the **Compute Using** option on the dropdown menu.

For additional practice, create a new text table and apply different calculations.



Section Four

Working with Maps

Plan and Objectives

Introduction

This module explores how Maps work inside Tableau. The Module starts with exploring why maps are important and how they should be used. Following this introduction, the module examines several key map types and the requirements to build them. The final section explores additional options available to customize maps in Tableau.

Objectives

At the end of this module students will be able to:

- Distinguish when a map should be used as a data visualization
- Associate map types with available spatial data in Tableau
- Change map types using the Tableau Marks card

Additional Reading/Resources

Use the links below to expand on the content discussed in class and in the assignment. Each article includes practice walkthroughs. Use the provided workbooks in the class activity to further practice what was discussed in the presentation.

- [Mapping concepts in Tableau](#)
- [Building maps in Tableau](#)
- [Customizing maps in Tableau](#)

Walkthrough Assignment

Maps play an important role in data visualization when used correctly. Using the prompts below, answer the following questions using Tableau maps and spatial data.

*A Tableau starter workbook has been provided for this assignment. You can access the workbook titled **Tableau Fundamentals - Maps_starter** in the exercise files folder.*

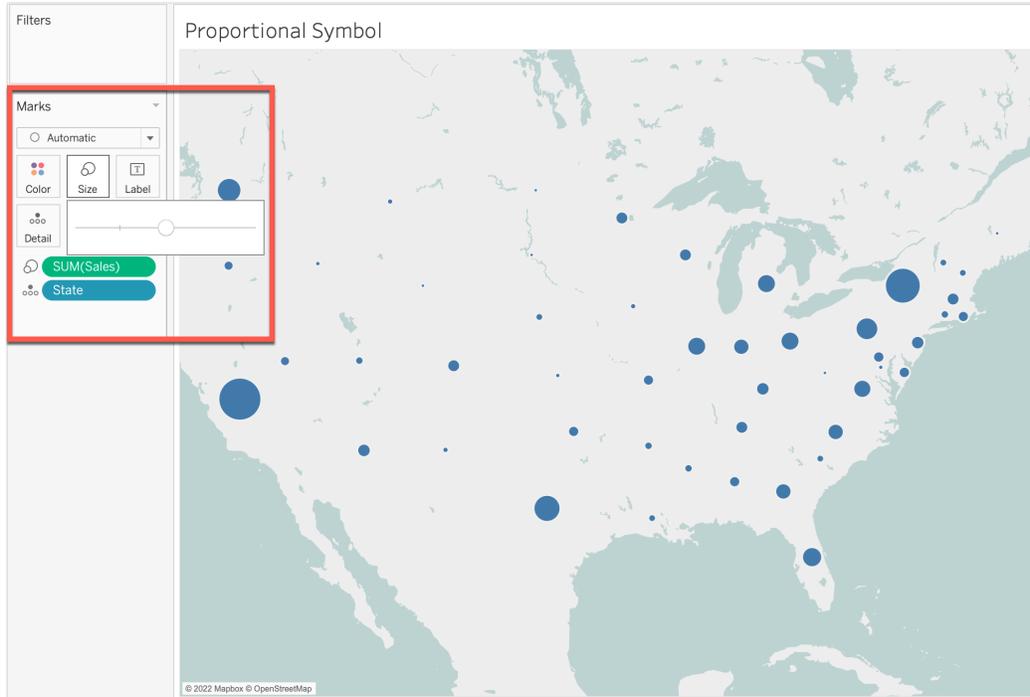
Proportional Symbols Map

Question #1 - Which region of the US contributed the most to the overall sales?

1. Create a new worksheet and rename it **Proportional Symbol**.



2. Drag the **State** dimension to the **Details** mark to create a simple symbol map.
3. Drag the **Sales** measure to the **Size** mark.
4. Click on the **Size** mark and adjust the size to the right.



Proportional map with different size symbols based on the values of a measure.

Since the State dimension has a geographical data role (indicated by the globe icon in the data pane), a symbol map is created by default when the dimension is added to the detail mark. Using the proportional symbol map, each state is represented by a circle. Adding Sales to the Size mark changes the size of each mark in proportion to the overall sales.

Looking at the proportion of each symbol, the northeast region of the United States contributed most to the overall sales.

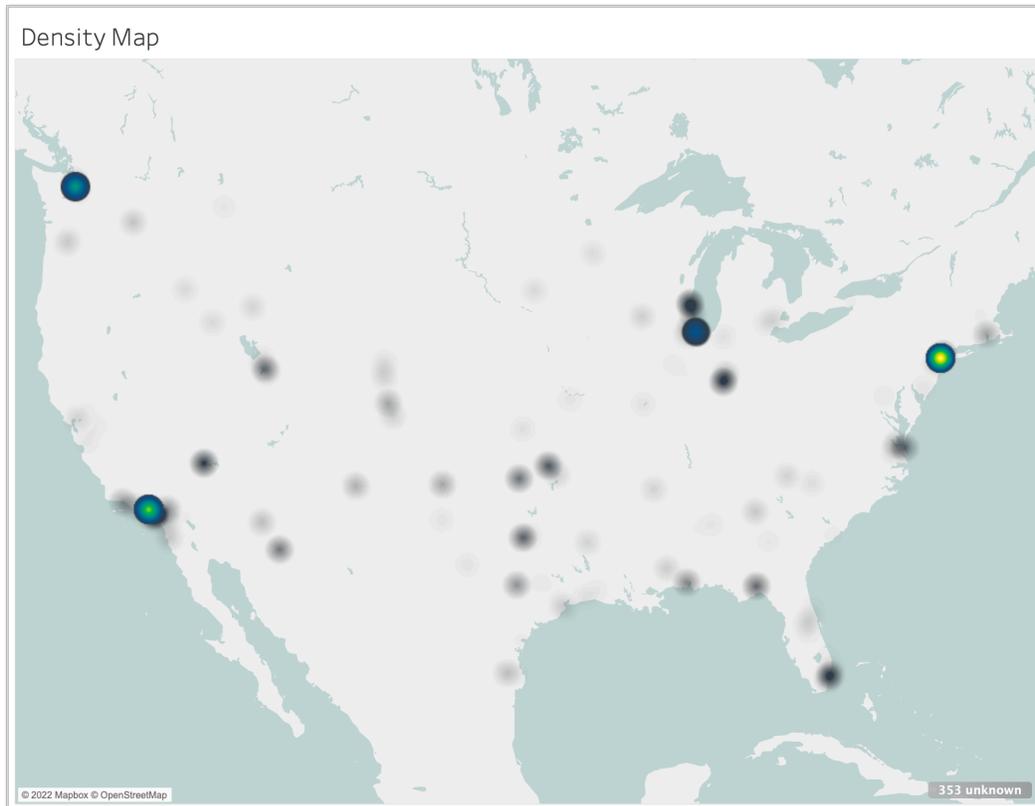
Recapping this question, it is important to discuss when a map should and should not be used. Look at the question and ask yourself, “Do I want to know the values and do I need to see it spatially?” Since regions are easily distinguishable, a bar chart would be an easier chart to display which region had higher sales. Reworking the question, comparing sales based on zip codes would be a better example of where a symbol map would be more efficient.

Density Map

Question #2 What major cities do a majority of Sales come from?



1. Create a new worksheet and rename it **Density Map**.
2. Drag the **City** dimension to the **Details** mark.
3. Using the dropdown menu on the **Marks** card, change the mark type to **Density**.
4. Drag **Sales** to the **Color** mark.
5. Click on the **Color** mark and change the color to **Density Multi-color Dark** using the **Color** dropdown menu.



Density map showing clusters of data using color.

Using a Heat or Density map is a great way to show where clusters of sales have originated . By adding Sales to the Color mark, the clusters become weighted based on the amount of sales in that area. Looking at this map, large clusters of sales are originating around the major cities of Los Angeles, New York, and Seattle.

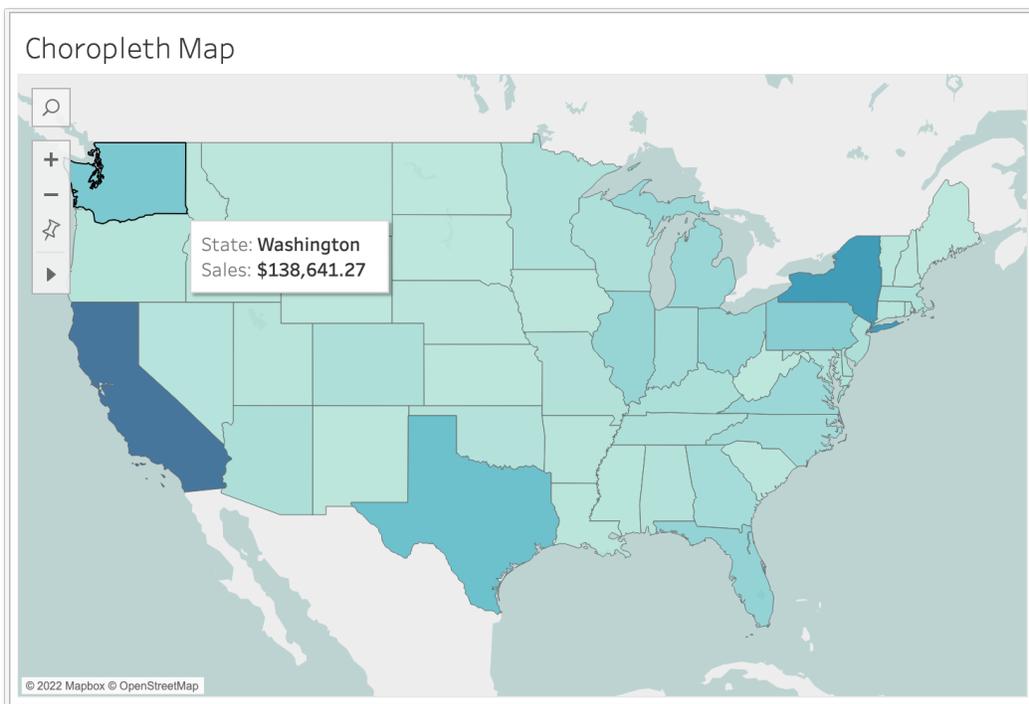
Choropleth Map

Question #3 Which west coast state has the second largest total sales?

1. Create a new worksheet and rename it **Choropleth Map**.
2. Drag the **State** dimension to the **Details** mark.
3. Drag the **Sales** measure to the **Color** mark.

After creating a symbol map, dragging a measure to the Color mark will create a choropleth map by default. Looking at the map, the range of Sales is displayed using a gradient of blue with a darker blue indicating a larger amount of sales.

Looking at the states on the west coast of the United States, Washington state is a darker blue than other states in the region. Based on that color, Washington appears to have the second highest sales in the region. While Washington appears to be the second highest, it is important to double check. Using the Tooltip, hover over the west coast states to identify their total sales. Hovering over each state, you can see that Washington does have the second highest sales.



Choropleth map showing a Tooltip



Adding customizations to your view

Plan and Objectives

Introduction

This module will explore how you can customize your views using Tableau. Starting with design basics, this module will explore how color, size, and fonts can be adjusted using the format option. After exploring the format option, this module will explore the Marks card and how color can be applied using measures and dimensions. Finally, this module will explore Trend Lines and Reference Lines to highlight specific points in your view.

Objectives

At the end of this module, students will be able to:

- Identify how to customize a workbook using the Tableau Format menu
- Apply customizations to a view using the Tableau Marks card
- Distinguish the difference between Trend lines and Reference lines when used to highlight data

Additional Reading/Resources

Use the links below to expand on the content discussed in class and in the assignment. Each article includes practice walkthroughs. Use the provided in-class activity to further practice what was discussed in the presentation.

- [Formatting in Tableau](#)
- [Customize the appearance of marks on a view](#)
- [Trend Lines in Tableau](#)
- [Reference Lines in Tableau](#)
- [Displaying Color Legends in Tableau](#)

Walkthrough Assignment

Understanding how to format your workbook is important when working with Tableau. Using the prompts below, explore how to answer questions about the Superstore data set using workbook customizations.

*A Tableau starter workbook has been provided for this assignment. You can access the workbook titled **Tableau Fundamentals - Customizations_starter** in the exercise files folder.*





Global Customizations

Before you start building your views, it is important to set up the format of your workbook. Follow the steps below to configure a workbook.

1. Open the workbook **Tableau Fundamentals - Customizations_starter**.
2. Open the **Format** menu from the navigation bar and click on the **Workbook** option.
3. Change the **Worksheet** font size to 12pt and the **Worksheets Titles** to 20pt.

Using the Workbook format menu, you can change the font size and font type globally for the entire workbook. This menu also allows you to change the gridlines for the entire workbook.

4. Reopen the **Format** menu and locate the **Workbook Theme** option.
5. Change the theme to **Modern**.

The Workbook Theme option allows you to set a standard font and size for the entire workbook. Notice how changing the theme updates the font type but does not change the font size. This is a good example of the larger to smaller setting.

Adding customizations to a view

As you are building your views, adding additional customizations not only provide a visual appeal, they can help tell a deeper data story. Use Tableau customizations to answer the questions below.

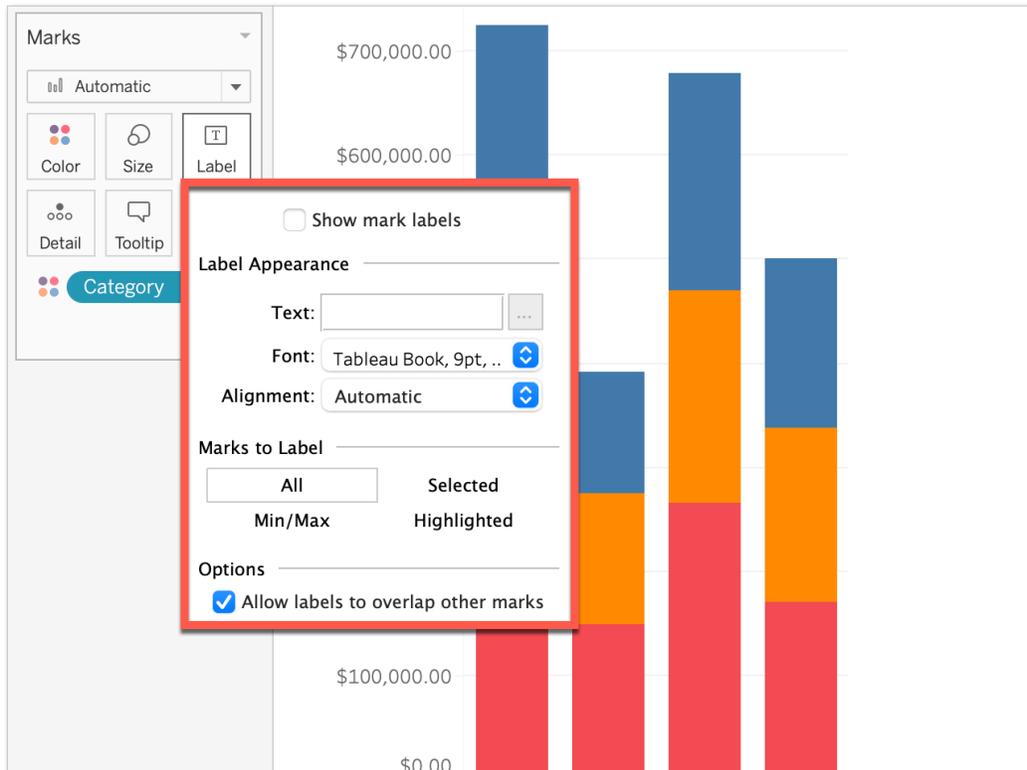
Question #1 - How much does each product category contribute to the overall person's sales?

1. Create a new worksheet and rename it **Color/Fonts**.
2. Drag the **Person** dimension to the **Columns** shelf and **Sales** measures to the **Rows** shelf.
3. Drag the **Category** dimension to the **Colors** mark on the **Marks** card.

By dragging the Category dimension on to the Colors mark you can separate the Sales for each person by category.

4. Click on the **Label** mark and check the box **Show mark labels**.
5. On the same menu, click **Selected** in the **Marks to Label** section.
6. Continuing on the same menu, open the **Font** dropdown.
7. Change the **Font** size to 12 and bold the text.



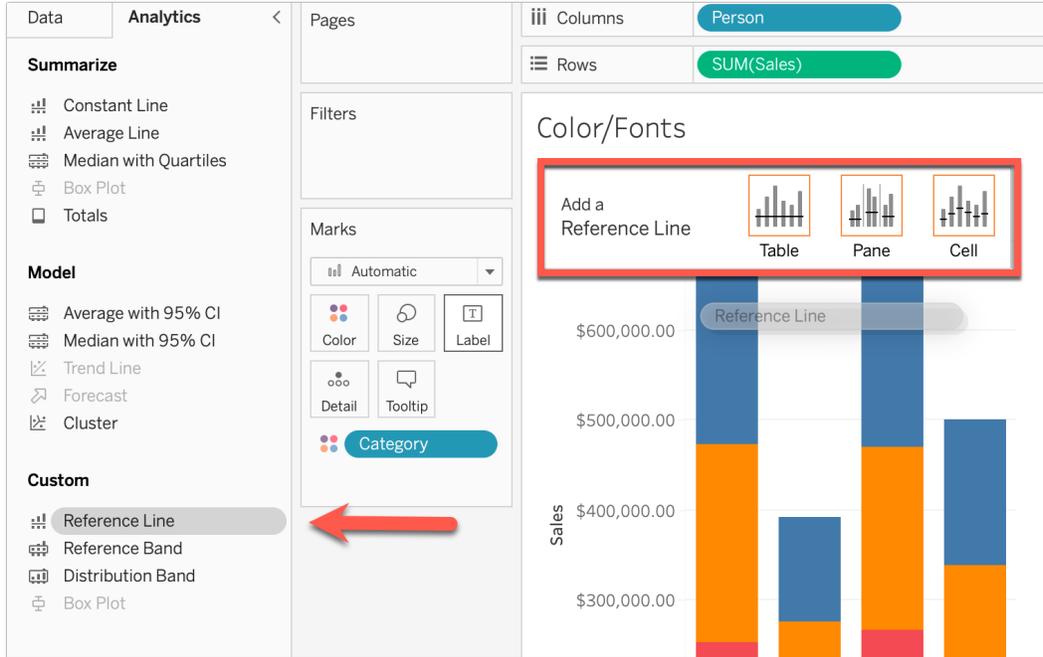


Mark labels can be added using the Label mark.

Configuring the label to appear on highlights provides the ability to show the numerical sales breakdown for each category. Bolding the text helps separate the values from the bar chart mark.

Question #2 - The Superstore sales quota is 650,000 for the last 5 years. Which sales person reached the sales quota?

1. Click on the **Analytics** pane and locate the **Reference Line** option.
2. Drag the **Reference Line** option to the view and highlight the **Table** option.
3. On the **Reference Line** edit menu, change the value measurement type to Minimum.
4. Click okay to add the **Reference Line**.

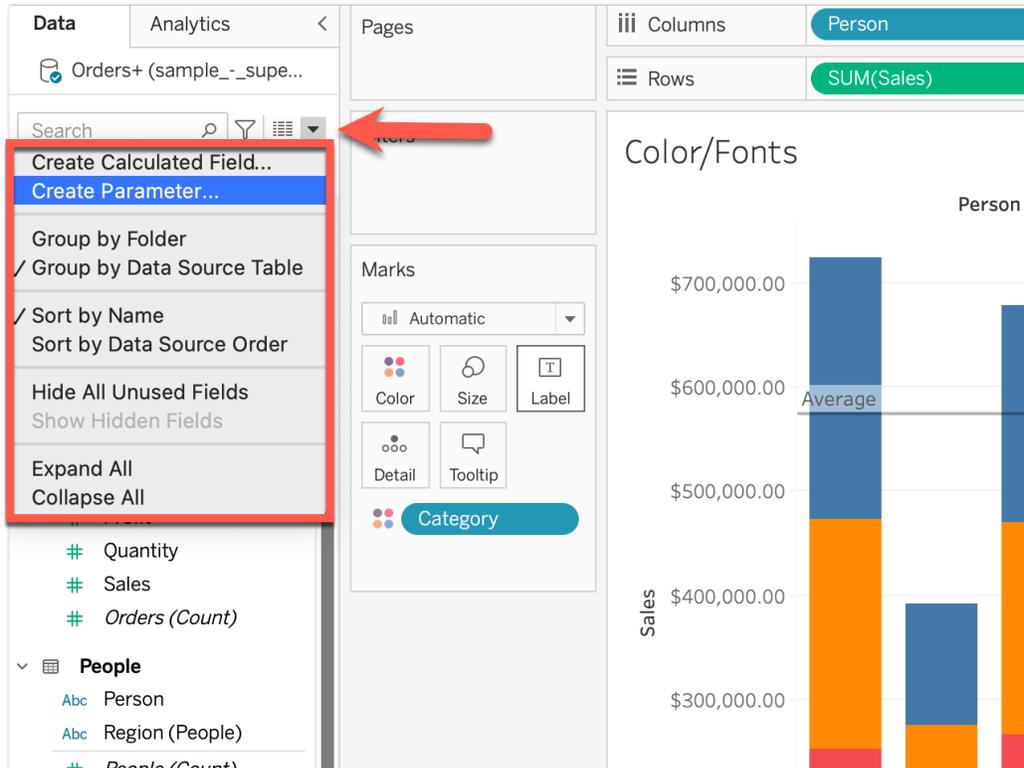


Reference Line option from the Analytics pane

Using the default settings, the line will be added to the minimum amount of total sales on the graph. For this graph, the reference line is added at 400,000 to match the sales by Cassandra Brandow. While this line points out that Cassandra is below the limit, it is tough to see who else could be below the limit. This can be fixed using a new custom parameter.

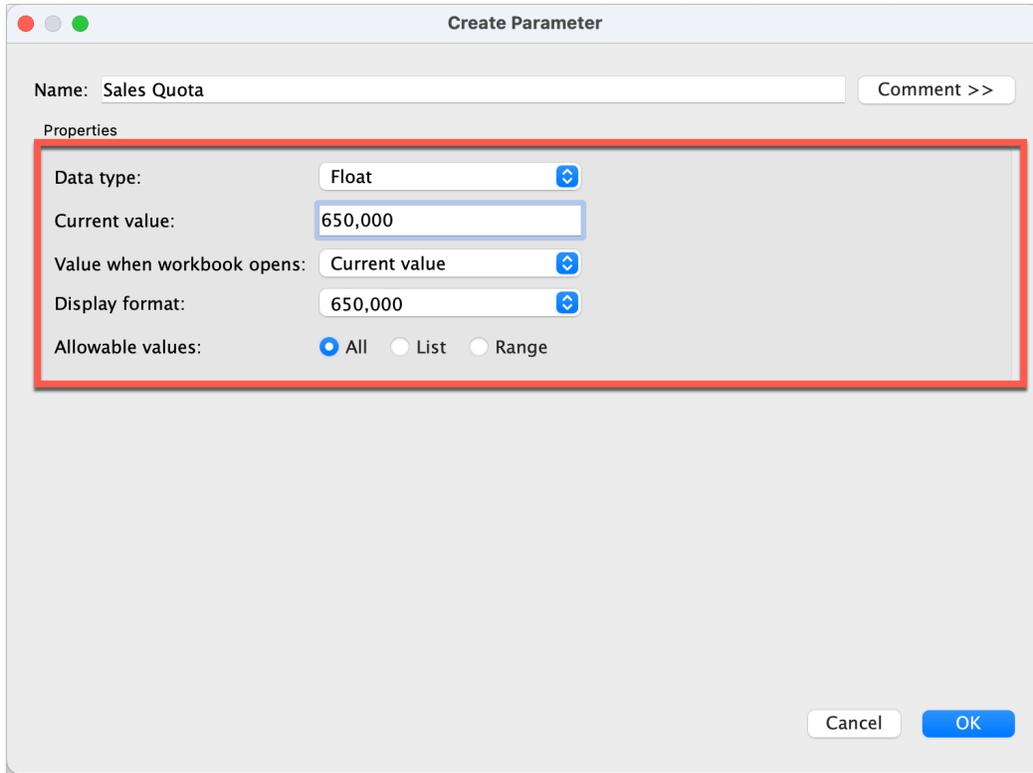
A Parameter is a variable that can replace a constant in a calculation, filter, or reference line. Parameters can be created using the Filters dialog box and the dropdown option on the data pane. Parameters can be toggled on and off using the Analytics dropdown menu.

5. Open the **Data** pane and open the dropdown menu to the right of the search bar.
6. Select **Create Parameter** from the dropdown menu.



Create Parameter option from the Data pane dropdown menu.

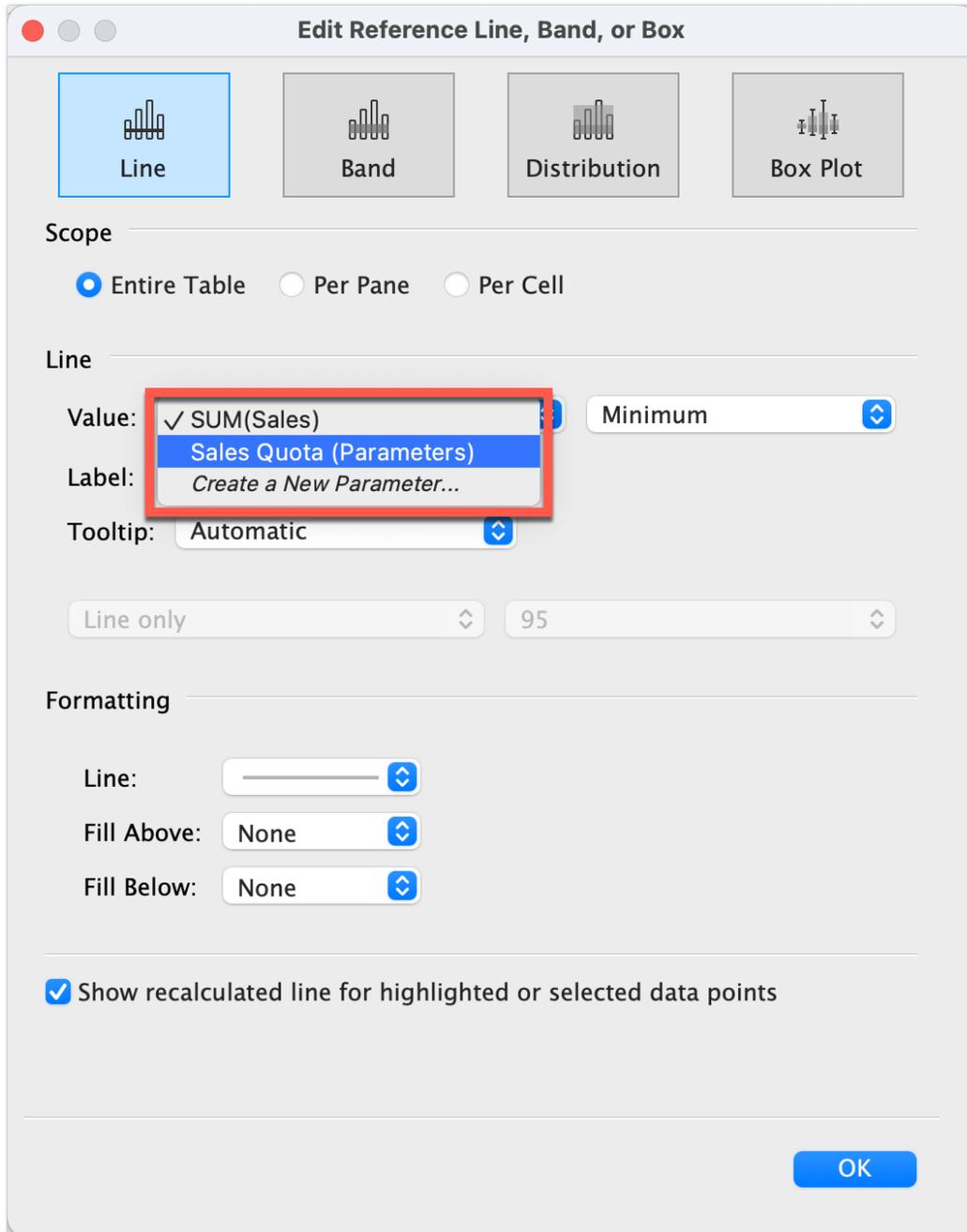
7. Rename the parameter **Sales Quota** and change the current value to 650,000.
8. Click **OK** to close out the menu.



Create Parameter dialog box

9. Right click the **Reference Line** on the view and select **Edit** from the dropdown menu.
10. On the popup menu, change the value under Line from **SUM(Sales)** to the **Sales Quota parameter**.
11. Click **OK** to close out the dialog box.





Changing Reference Line value to a parameter

Looking at the new Reference Line, you can see that Anna Andreadi and Chuck Magee hit the sales quota. Using a Reference Line is a great way to customize a view and call out a specific value.

Combining your views

Plan and Objectives

Introduction

In this module, you will learn how to combine views and dashboards to tell a data story. Starting with Dashboards, this module will discuss best practices and explore how a dashboard is created. After creating a dashboard, the module will explore how stories work and how to create them. Lastly, this module will explore how to share a workbook with other people.

Objectives

At the end of this module, you will be able to:

- Combine views to create a Tableau dashboard
- Create a Tableau story using worksheets and dashboards
- Identify how to share workbooks with other people

Additional Reading/Resources

Use the links below to expand on the content discussed in class and in the assignment. Each article includes practice walkthroughs. Use the provided workbooks in the class activity to further practice what was discussed in the presentation.

- [Creating a Dashboard](#)
- [Adding Dashboard Actions](#)
- [Creating a Tableau Story](#)
- [Publishing data sources and workbooks](#)

Walkthrough Assignment

*A Tableau starter workbook has been provided for this assignment. You can access the workbook titled **Tableau Fundamentals - Combining Views_starter** in the exercise files folder.*

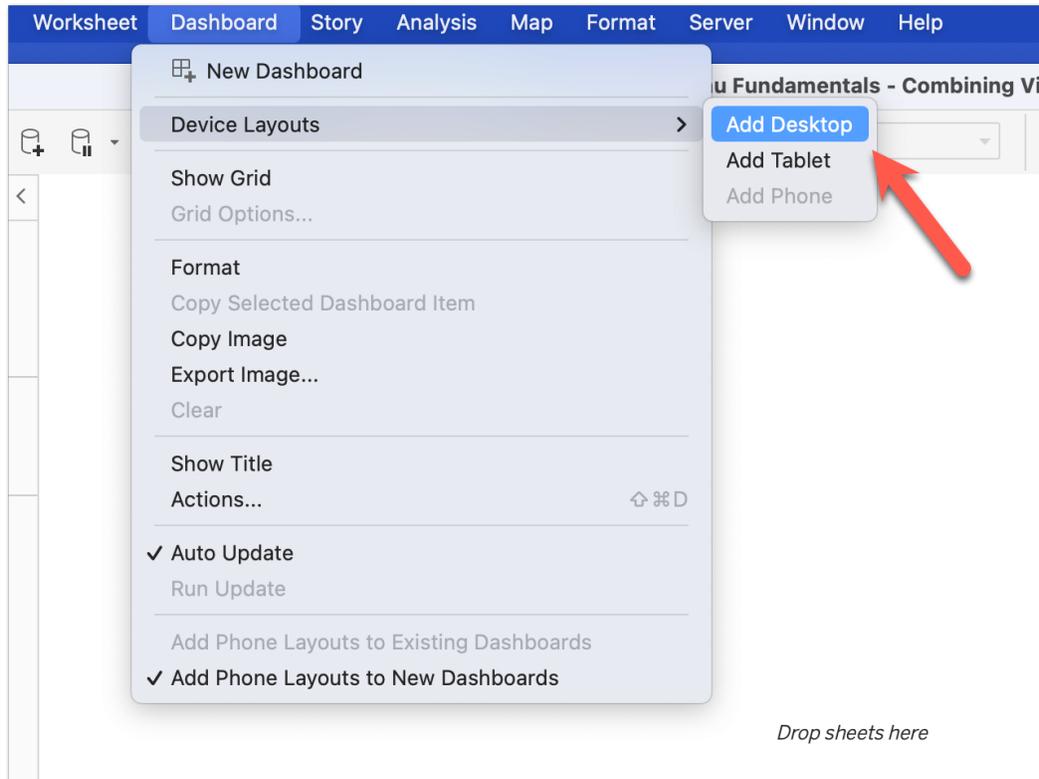
Building a Dashboard

Using the power of Tableau, worksheets can be combined into one single dashboard. This provides the ability to give quick data insights and tell a complete story. Using the prompts below, follow along the process of creating a Superstore KPI Dashboard.

1. Open the **Tableau Fundamentals - Combining Views_starter** workbook.

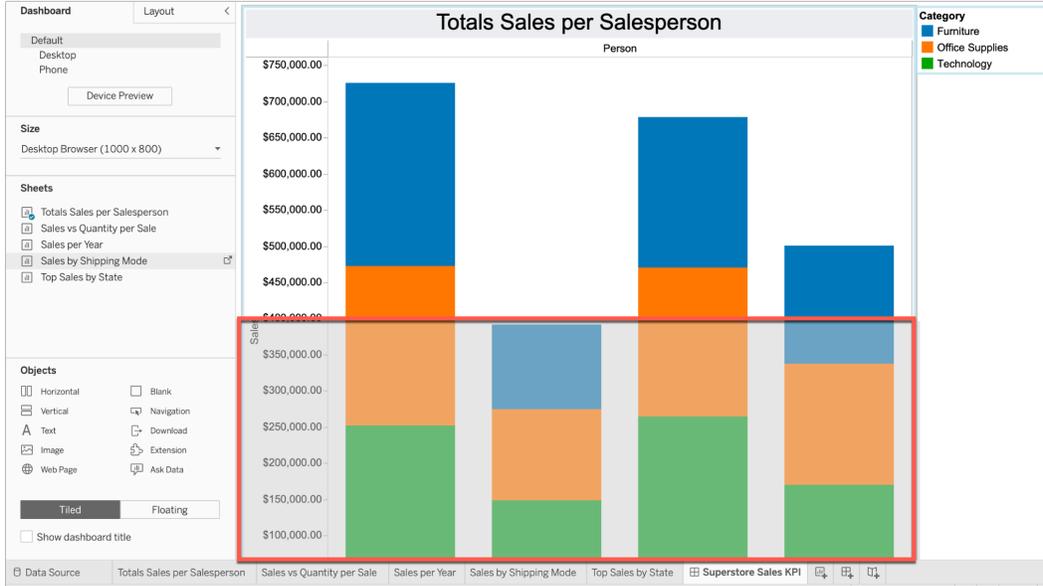


2. Create a **New Dashboard** and rename it **Superstore Sales KPI**.
3. Add a **Desktop** view from the **Device Layout** options on the **Dashboard** menu located on the navigation bar.



Dashboard Layouts option from the Dashboard menu

4. Ensure **Default** is selected at the top of the **Dashboard pane**.
5. Using the **Format** option on the **Dashboard** navigation bar menu, change the default background to light gray.
6. Close out the **Format** options using the **X** in the top right corner of the **Format** pane.
7. Drag the sheet **Total Sales per Salesperson** to the **Dashboard**.
8. Drag **Sales by Shipping Mode** to the bottom of the dashboard until a gray bar takes up half of the dashboard.
9. Drag **Sales per Year** to the bottom until a gray box takes up half the space of the **Sales by Shipping Mode** worksheet.



Gray boxes will appear on the Dashboard indicating where the sheet can be placed.

10. Drag a **Text** object to the top left corner until a gray box takes up half of the sheet **Total Sales per Salesperson**.

11. Enter the text **Superstore Sales** and change the font size to 22 pts.

12. Adjust the size of the **Text** object to take up about 1/3 of the Dashboard.

After dragging the sheets to the Dashboard, a complete Dashboard has been created. After creating the Dashboard, it is easy to mess up the layout. Deleting one of the sheets from the Dashboard will automatically change the layout. Often, there are times where you want/need to swap out a sheet on the Dashboard. Sheets can be swapped out without affecting the layout.

13. On the **Dashboard**, click on the sheet **Sales by Shipping Mode**.

14. On the **Dashboard pane**, hover over the sheet **Top Sales by State**.

15. Once highlighted, click on the curved double arrow icon on the right side of the sheet title to swap the sheets.





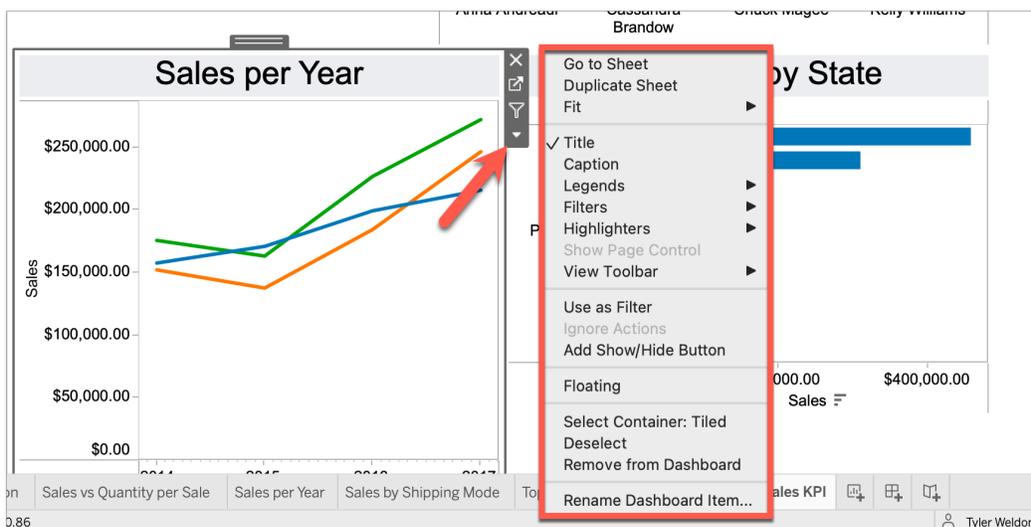
Sheets can be swapped out on the Dashboard from the Dashboard pane.

Dashboard Actions

Adding interactivity is a great way to add an exploratory state to your Dashboard. Depending on the context of your Dashboard, you might want to add the ability for the audience to dive deeper into the data. Using the walkthrough below, add interactivity to the dashboard to answer the following question.

Question #1 - What are the top three states for technology sales?

1. Select the sheet **Sales per Year**.
2. Click on the dropdown arrow on the far right side of the highlighted sheet.
3. On the more options menu, select **Use as Filter**.

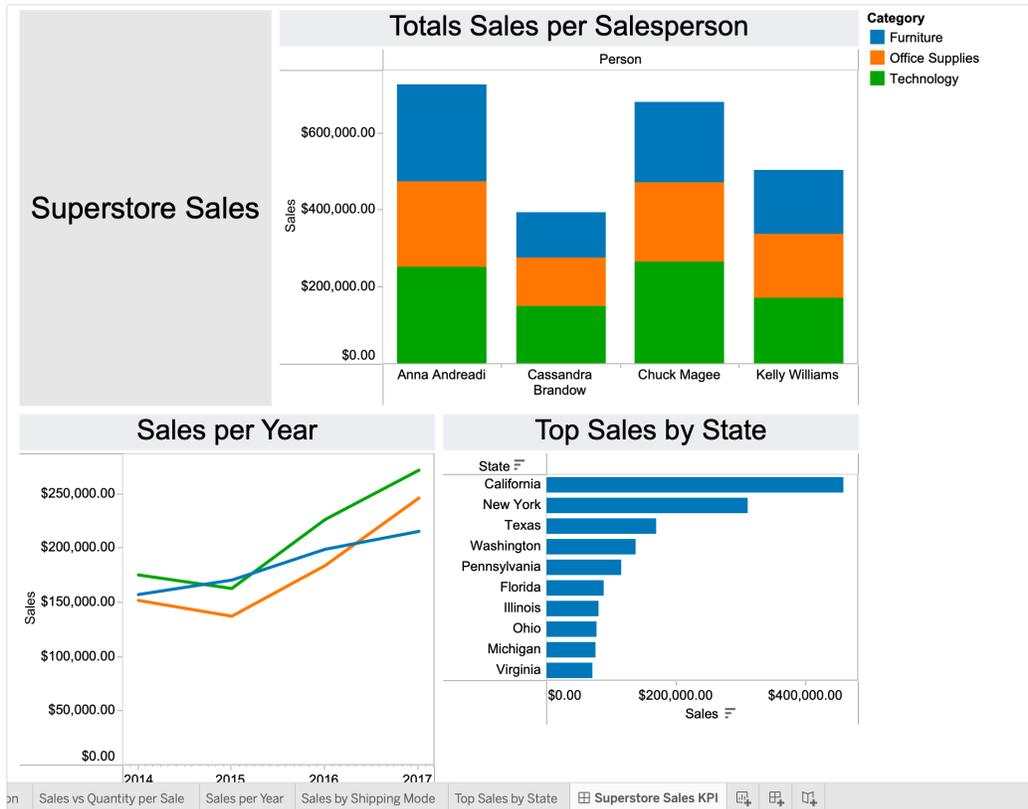


Dropdown menu option available from an individual sheet.



Selecting this option applies a filter to the other views on the dashboard. When you click on one of the marks on the Sales per Year view, the other views will change and filter based on that selection. This feature can be toggled on and off by clicking on the funnel icon above the More Options dropdown arrow on the right side of the highlighted sheet.

Alternatively, the filter action can be set up from the Dashboard menu on the navigation bar. The feature is available by clicking on the actions option on the dropdown menu.



Dashboard example

After selecting the technology mark on the Sales per Year sheet, California, New York, and Pennsylvania are shown to have the highest sales per state. Notice these states change if you click on another mark on the Sales per Year sheet. Using a sheet as a filter is a great example of how a dashboard action on one sheet can help answer a question from another sheet.



Tableau Story

Tableau stories are a great way to combine worksheets/dashboards to tell an overall story. Each worksheet or dashboard is placed on its own story point. Using the walkthrough below, create a set of story points to answer the question.

Question #1 - How have sales performed over the past 5 years?

1. Create a **New Story** from the status bar and rename it **Superstore Sales Story**.
2. Drag the sheet **Total Sales per Salesperson** to the first story point.
3. Edit the caption to say 3/4 people have sold over 500,000 in products.
4. Drag the sheet **Sales per Year** to the right of the first caption box and release.
5. Edit the second caption box to say “Sales for each category have increased over the years”.
6. Drag the sheet **Top Sales by State** to the right of the second caption box and release.
7. Edit the caption box to say “The lowest amount of sales occurred in Virginia and Michigan”.



Tableau Story with multiple story points

After adding the three story points, a Tableau story has been created on the success of Superstore sales. Notice the first story point tells the success of each salesperson. The second point highlights how the overall sales performed each year. The third point highlighted sales for each state.



One great feature of stories is the ability to add callouts and annotations. Go back through each story point and annotate areas you feel are important. The annotations can range from a single point, a mark, or area. See the Tableau Fundamentals - Combining Views_final workbook for examples of story point annotations.

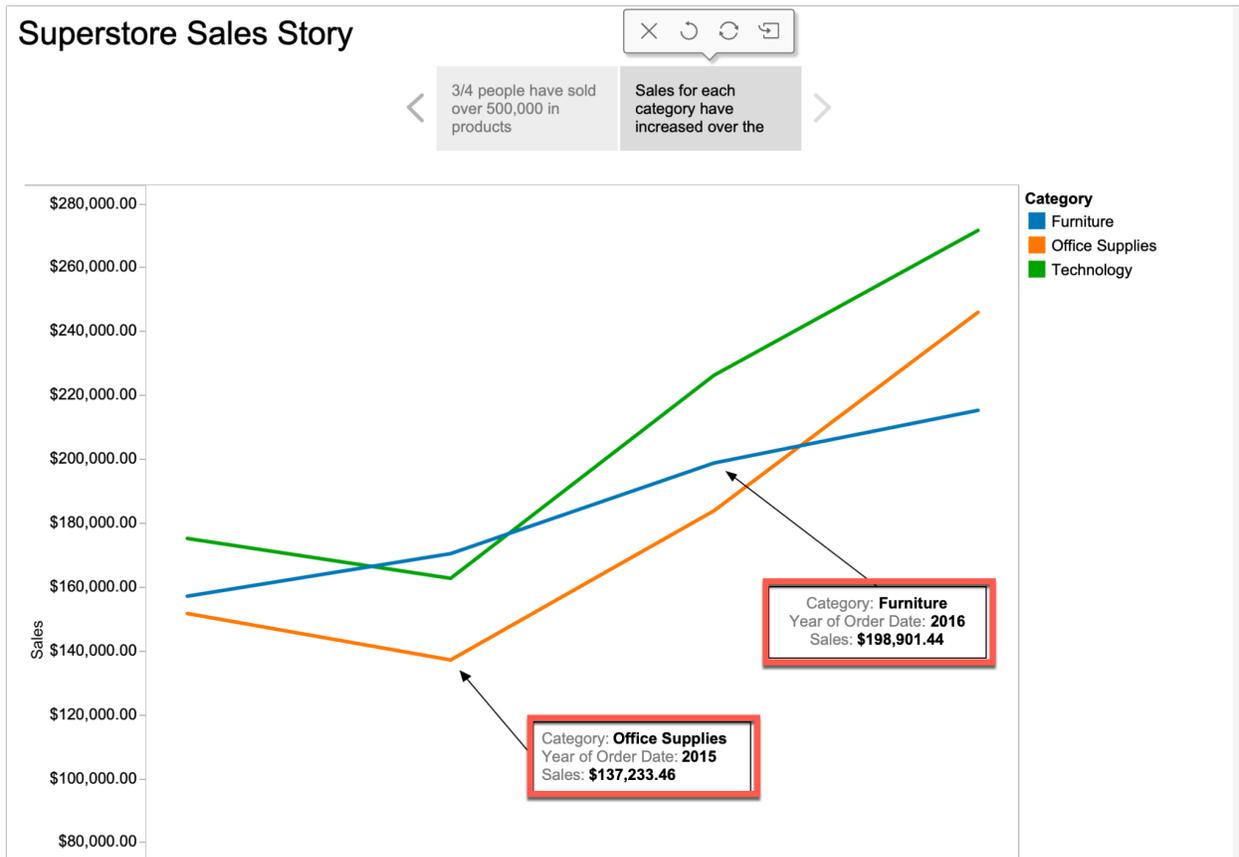


Tableau story point with annotations.





Credits

Resources

Airport Data Set - Provided by Mike Galbreth via Tableau Desktop Training Curriculum

Hurricane Data Set - Provided by NOAA National Hurricane Data Center

