Tableau 2: Beyond Basics
Download both Tableau 2 Excel workshop data files under the “Workshop Materials” tab: https://research.library.gsu.edu/tableau

- **Tableau 2 Workshop Data: Expanded Superstore** | Scatterplots, Histograms, Area Charts, and Combination Charts
- **Tableau 2 Workshop Data: CO2 Emissions** | Joining and Unioning, Calculations, and Filter Actions

Advanced Visualization Types

**Scatterplots**

Scatterplots compare two numerical variables, one along the x-axis and one along the y-axis. Trend lines are often applied to scatterplots to determine what kind of relationship the variables have.

- Scatterplots require 2 Measure (numerical/green) pills
- Example: Sales v. Profit
- Open a new worksheet and drag the “Sales” pill into Rows, and “Profit” into Columns
- Drag the “Category” dimension onto Color in the Marks card
- Drag the “Region” dimension onto Detail in the Marks card

![Profit v. Sales, colored by Category](https://research.library.gsu.edu/tableau)
• Use the Analytics tab to add trend lines to scatter plot (Analytics tab > Model > Trend Line > Click and drag to select trend type)

**Area Charts**

Area charts are a variation on line charts, with the space underneath the line filled in. Like line charts, area charts are typically used to show changes over time, and may compare multiple categories. Area charts are better for determining overall relationships than reading individual values.

**Stacked Area Chart** – Categories are stacked, which shows how each category contributes to the whole area. Tableau defaults to a stacked chart.

• Stacked chart values are read line-to-line (rather than axis-to-line) because no area is obscured behind another area
• Open a new worksheet and drag “Order Date” to Columns and “Quantity” to Rows
• Hover over the “Order Date” pill and click on the small white arrow to show additional time options. Select the first listing for “Month” (we’re just going to look at aggregated data).
• Drag “Ship Mode” to Color on the Marks card
• On the Marks card, open the dropdown menu and select “Area”

![Image of a chart showing order quantity vs. time, colored by ship mode (Stacked Area)](image)

**Overlapping Area Chart** – Categories overlap one another, which helps compare the magnitude of change over time. You must convert to this chart type from a stacked area chart.

• To convert a stacked area chart to an overlapping chart
  o Analysis tab (top bar) > Stack Marks > Off
  o Marks card > Color > Opacity (adjust slider to less than 100%)
Alternatively, sort the categories in the Marks card for better visibility (Marks card > Ship Mode pill dropdown > Sort > Manual)

- The overlapping chart can become confusing if there are more than 2-3 categories, especially if numerical values are similar

**Combination charts**

Combination charts can be almost anything – they use different chart or mark types in the same visualization, typically utilizing the “dual axis” feature.

- Open a new worksheet and drag “Order Date” to Columns. Select the dropdown on the new “Order Date” pill and choose the first “Month” option.
- Drag both a “Sales” pill and a “Profit” pill to Rows. They should still look like separate pills at this point.
- Select the dropdown arrow on the second pill in Rows. In our pictured example, this is “Profit”. Pick “Dual Axis” from the menu. Pills sharing a dual axis are shown flattened against each other:

```
Rows: [SUM(Sales), SUM(Profit)]
```

- Right click the y-axis on either side of the graph (Sales or Profit) and choose “Synchronize Axis”
- In the Marks card, choose the Profit tab and use the dropdown menu to convert the visualization type from “Automatic” to “Bar”
Calculated Fields

If your data set does not include all the fields you want to use in a visualization, you can create a calculated field or a table calculation based on data already in your data set.

Calculated Fields – Create a new field in your data set based on calculations

- Right click on the data pane and select “Create Calculated Field” from the menu to open the Calculations Editor.
- Functions in Tableau fall into one of several categories (Number, String, Date, etc.).
- Calculated fields can be created by using simple mathematical operations or by using the built in functions.
Combining Data Sets

There are two basic ways of combining data sets in Tableau: Joins and Unions.

Join Your Data

Joins combine a column of two data sets with a common variable.

To join two datasets from Tableau’s Data Source page:

1. Select one data table.
2. Drag another data table just to the right of the first one.
3. The columns of both datasets will show up in the preview pane below allowing you to work with both data sets.
4. Click on the join symbol to manually adjust how the data sets are joined.

- The inner join creates a new table that only includes fields common to both datasets.
- Left join creates a new table that includes data from the left table and corresponding matches from the right table.
- Right Join creates a new table that includes data from the right table and corresponding matches from the left table.
- Full Outer join creates a table that includes all the data from both tables.
5. From the join menu, you can also select which fields with which to match rows.

Union Your Data

Unions combine data from one or more data sets by stacking rows on top of each other.

To Union two data sets together from Tableau’s Data Source Page:

1. Select one data table.
2. Drag another data table on top of the first one until you see the orange box appear.

Table Calculations

Table Calculations allow you to perform calculations on values in a visualization you have created.

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- You can create table calculation by right clicking on a measure pill in the Marks card or Columns/Rows shelf.
- You can use the predefined set of “Quick Table Calculations” by right clicking on a pill in the Marks card or Columns/Rows shelf.
- Use the “Add Table Calculation” option to create your own calculation using the calculation editor.
- A table calculation pill will have a delta symbol to indicate that it is a calculated and not from the original data set.
- In the example below we used a “Quick Table Calculation” to Label each column with the “Percent of Total” Quick calculation.

Sheet Design

We’re going to create 2 new sheets for our dashboard filter example.

- Open a new sheet and name it “CO2 Emissions Over Time”
- Right click on the “CO2 per capita” pill. Click on default properties-> Aggregation-> Average. Then drag that pill to the Rows shelf.
- Drag the “Year” pill into the Columns shelf.
- Drag the “Country Name” onto the “Detail” card.
- Drag “CO2 per capita” from the Side Bar onto the “Color” card.
- Click the Color card to edit the colors.
  - Select the “Red-Black Diverging” Palatte
  - Put a check in the “Reversed” box
- Put a check in the “Use Full Color Range” box
- Click the Advanced button and set the center to 5

- Open a new sheet and name it “CO2 Map.”
- Drag the “Country Name” pill into the main workspace.
- Drag the “CO2 per capita” into the “Size” card.
- Click on the “Size” card to adjust the size of the bubbles
- Click on the “Color” card to adjust opacity and add a border
- Drag the “CO2 per capita” pill into the “color” card and edit the colors as we did in the previous (CO2 Emissions Over Time) example.
Dashboard Controls and Design

Filter Actions

- Add dashboard level filters to by clicking Dashboard > Actions > Add Action
- From the Add Action menu, choose “Filter”, then select the source and target sheets for your filter.
- Depending on the fields used in your dashboard, you may be able to create a dashboard level filter by clicking the “more options” button on one of the sheets in your dashboard and selecting the “use as filter” option.

Dashboard Design

- Put the most important content or key insights in the top left corner
- Limit the total number of worksheets/charts on a single dashboard to 2 or 3
- Use dashboard-level filters to tie visualizations together
- Standardize colors and typefaces across the charts on a single viz
- Consider reducing permanent text in favor of tooltips, so users can choose the level of info