Visualizing Small Sets of Data with Excel and Google Chart

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Objectives:

1. Use Excel to make a chart for publication.
2. Learn how to use the color tools to pick up color-blind friendly color schemes.
3. Learn how to save the chart to the file format specified by the publisher such as EPS or TIFF.
4. Use Google Chart to embed an interactive chart into a webpage.

1. Creating a chart for publication

a. Creating a new Excel workbook

   i. Excel-> New workbook, Excel->File-> Save, save the file to the desktop and name it as publication-1. A workbook is an Excel file that contains one or more worksheets.
   ii. Type in 1997, 1998 in cell A2 and A3, then use AutoFill function to auto fill A4 through A18.
      1. AutoFill handle
         a. Select A2 and A3, Excel will see the pattern, mouse over the lower right corner of the selected cells, you will see a black cross, which is the AutoFill handle.
         b. Press and hold down the left mouse button over the AutoFill handle, and drag it through A18.
   iii. Type in the column labels starting from B1 through L1.
   iv. Or you can open the ready for use Excel file, highlight the data from B1 to L1, click "Enable Editing" if that message pops up, copy. Then go to the newly created publication-1 Excel file, highlight B1 through L1, click on Paste -> Keep source column width.
   v. Note:
      1. leave A1 blank. Otherwise, it will screw up the appearance of the chart.
      2. on PC, if you can't bring the sheets to view, go to View -> Arrange All -> Horizontal
   vi. There are three types of data in a cell. They are number, text and formula. When you start typing in a cell, the data type will be *general*.
      1. If Excel recognizes the data as text, the text will be left aligned.
      2. If Excel recognizes the data as a number, the number will be right aligned.
      3. Formula starts with an = equal sign. For instance, use this formula to calculate the sum from cell B2 through L2. In the cell M2, type in *=sum(B2:BL)*
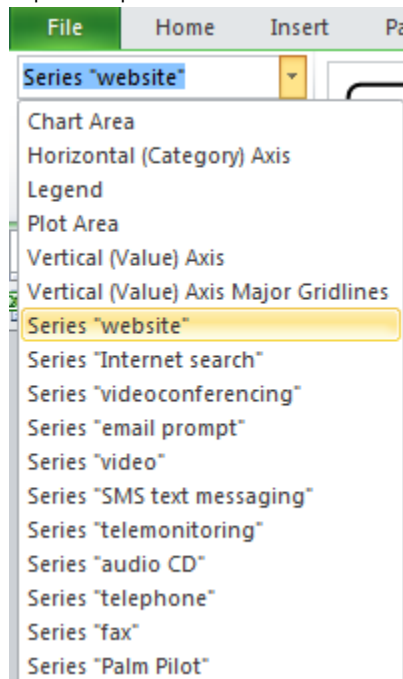
b. Creating the Chart

   i. Highlight the data set from A1 through L18, on Mac, Chart -> Column -> Stacked Column; on PC, Insert -> Column -> Stacked Column.
   ii. Use Chart quick layout to quickly change from one layout to another layout to taste different layout.
   iii. Chart Style is to change the appearance of the chart. Style 1 is a gray color scheme and style 2 is a color scheme. Although the built-in color schemes are all color-blind friendly, the first two are recommended since they produce the best effects.
   iv. Chart-> Format. Here you can format the chart to the way you want.
   v. Right click over the chart, select Move Chart to a new sheet. This will put the chart to a new sheet.

c. Changing Color Scheme

   i. go to Color Brewer http://colorbrewer2.org/
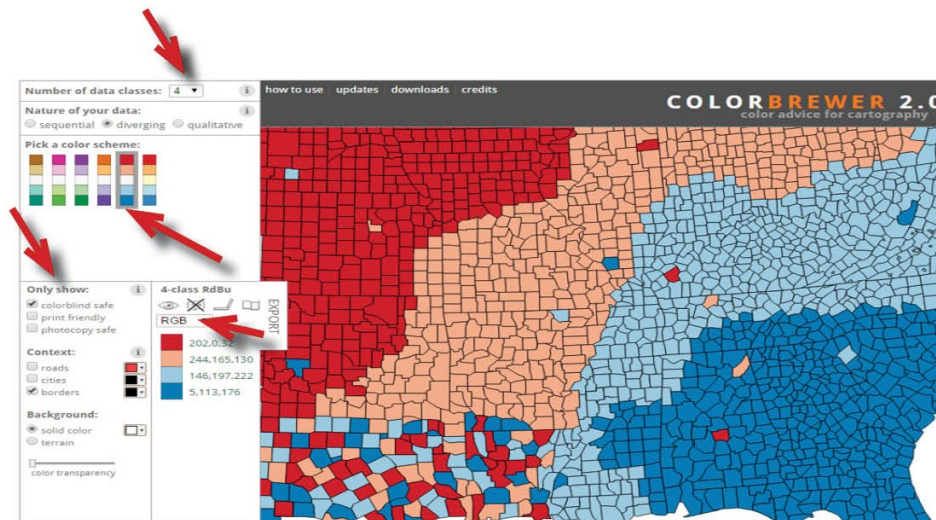
ii. change the data classes to the number you want, check the right nature of your data, check only show "colorblind safe", choos RGB from the dropdown menu, and write down the RGB values for the selected color scheme.

iii. back to publication-1 Excel file, on Mac, select area, on PC, Format -> Chart Elements, Select the chart elements, then go to Shape Fill -> More Fill Colors... -> Custom, type in the RGB values that you wrote down from the previous step. Repeat this process for all the series elements. Make sure you select Series, not an individual element of a series.

d. **Creating the Chart as a EPS or TIFF image file**

    i. On Mac, right click over the chart/graph, Save as Picture... in the format of PNG, JPG, PDF, BMP, GIF, choose PDF.

    ii. On PC, File -> Save as Adobe PDF, choose the sheet(s) you want to create PDF.

    iii. Convert PDF to Tiff or EPS

        a. Open the PDF with Illustrator, File -> Save as -> EPS

        b. Open the PDF with Illustrator, File -> Export -> Tiff, choose color space and dpi (i.e. 300) and save the file.
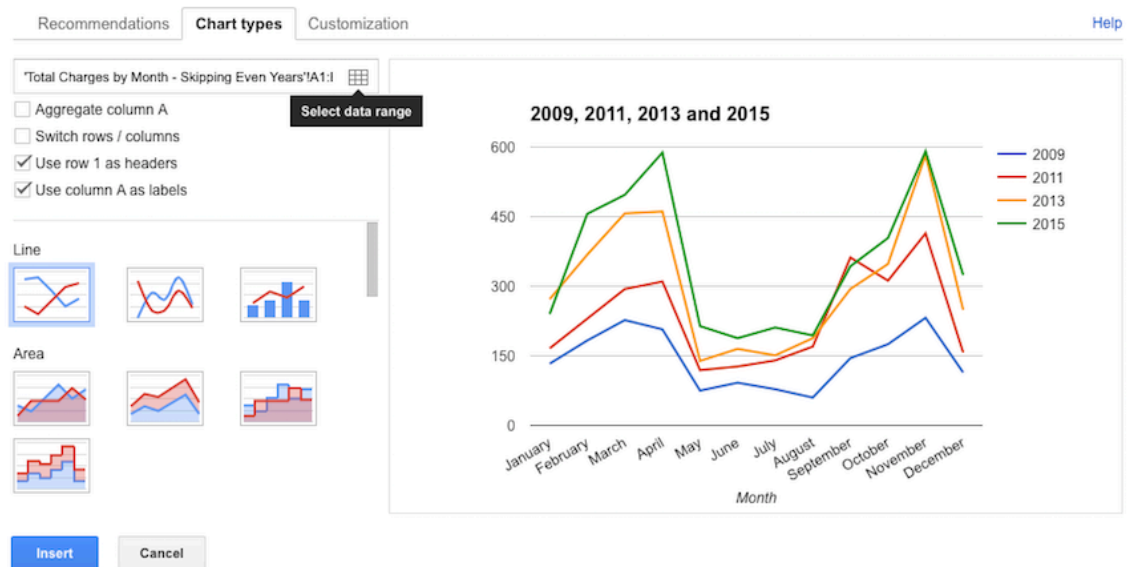
e. **Color proof with Illustrator**

    i. Open the saved PDF file with Illustrator

    ii. View -> proof setup -> Color blindness

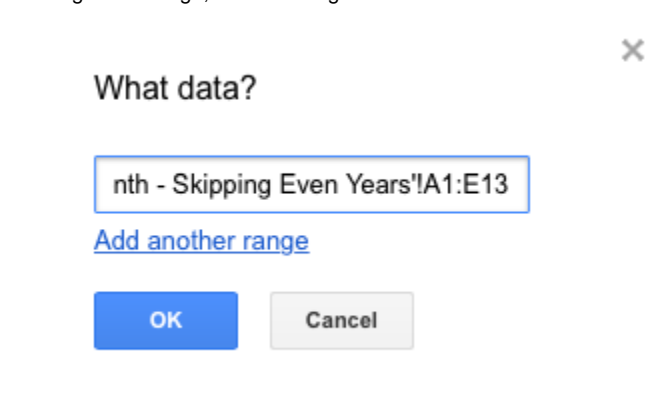2. **Creating a chart to embed on a website**
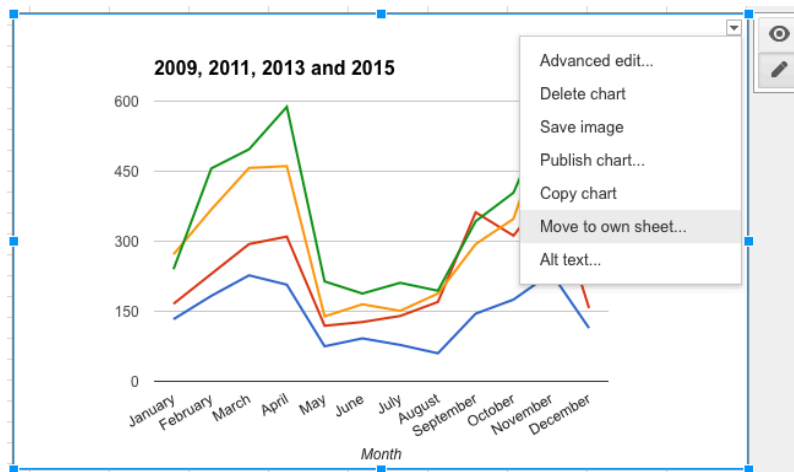
a. **Creating a Google spreadsheet**

i. select the data, Insert Chart...

Chart Editor

ii. to change data range, click on the grid button on the above screenshot image.
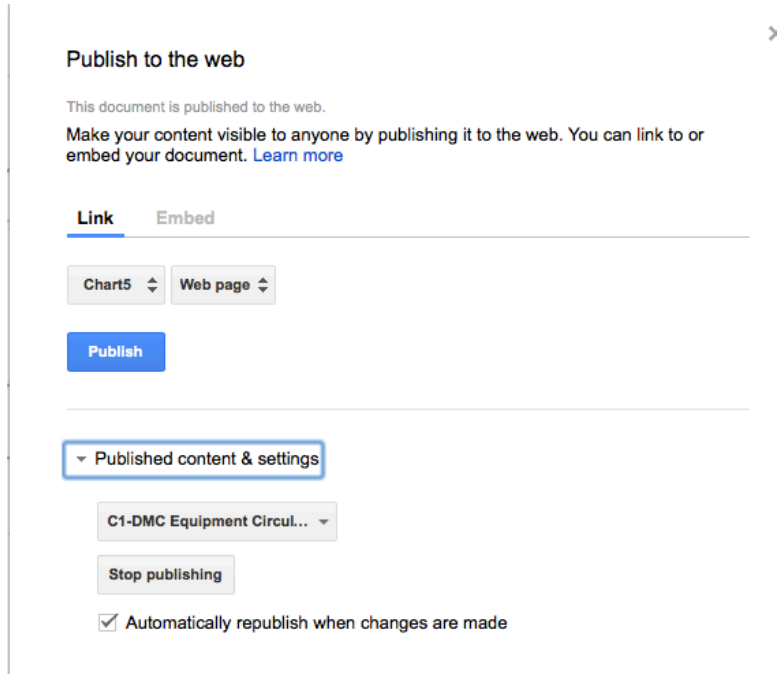

iii. Change the appearance of the chart with Customization tab.
iv. Then click on **Insert** on the Chart Editor window.

v. **Choose Move to own sheet** from the drop down menu on the upper right corner of the chart. This will put the chart on a separate sheet, which is more convenient for publishing.

vi. Click on **Publish Chart,** you can publish chart via a link to a webpage or PDF, or you can publish via the embedding code.

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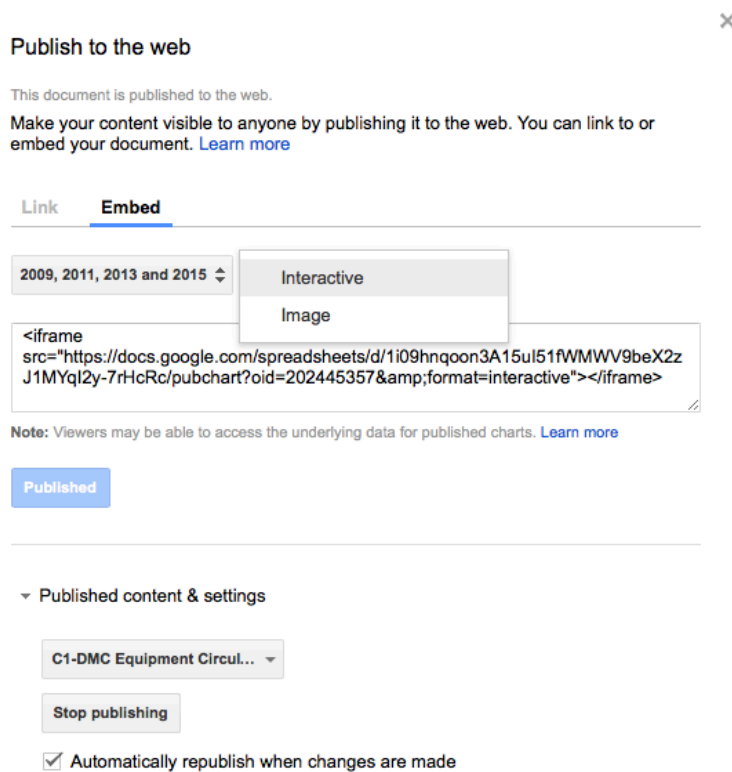Make your content visible to anyone by publishing it to the web. You can link to or embed your document. Learn more

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[2009, 2011, 2013 and 2015 ⇕]   [Interactive]
                                   [Image]

```
<iframe
src="https://docs.google.com/spreadsheets/d/1i09hnqoon3A15ul51fWMWV9beX2z
J1MYql2y-7rHcRc/pubchart?oid=202445357&amp;format=interactive"></iframe>
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https://docs.google.com/a/rice.edu/spreadsheets/d/1ilTM45NizWoLfkqzBBIEdgxuZ_

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✓ Automatically republish when changes are made

References

1. Color Brewer http://colorbrewer2.org/
2. Choice of colors in print and graphics for color-blind readers http://www.edwardtufte.com/bboard/q-and-a-fetch-msg?msg_id=0000HT
3. Google chart gallery https://developers.google.com/chart/interactive/docs/gallery
4. Excel number format https://support.office.com/en-us/article/Available-number-formats-0afe8f52-97db-41f1-b972-4b46e9f1e8d2
5. Excel data format: when you start typing in the cell, Excel will classify as General data type, which might need to be corrected. General can be text or number. If Excel recognizes the data as text, left aligned, if Excel recognizes as number, right aligned. Enter to go to next cell in a column, Tab to go to next cell in a row. Four data types in Excel: Logical, Number, Text, Error http://johnatten.com/2011/10/03/microsoft-excel-basics-part-ii-data-types-in-excel/
6. Microsoft Excel Data Types https://msdn.microsoft.com/en-us/library/ms712640(v=vs.85).aspx
7. Creating Spreadsheet file using Excel http://www2.gsu.edu/~mstmbs/Eval/Excel.html
8. Excel vocabulary http://mrhennings.typepad.com/files/excelvocab.pdf
9. Fill data automatically in worksheet cells https://support.office.com/en-us/article/Fill-data-automatically-in-worksheet-cells-74e31bdd-d993-45da-aa82-35a236c5b5db
10. Add or remove predefined lines or bars in a chart https://support.office.com/en-gb/article/Add-or-remove-predefined-lines-or-bars-in-a-chart-e51fdbdb-532d-4a5c-a91b-c85d3932734a
11. Move or copy rows and columns https://support.office.com/en-us/article/Move-or-copy-rows-and-columns-3ebbcafd-8566-42d8-8023-a2ec62746cfc