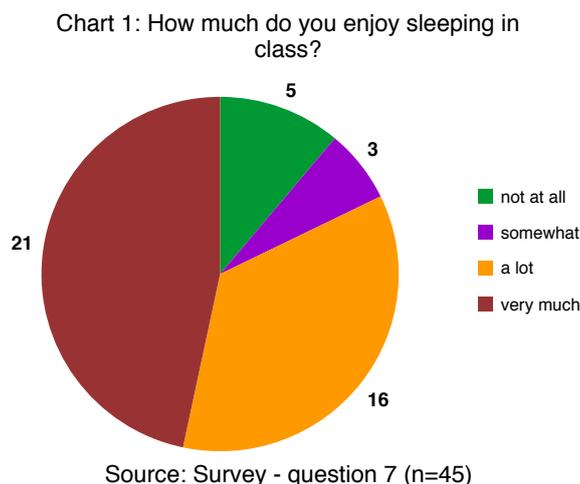


Presenting Data Effectively

It is important to present your data effectively. Here are two examples. The first one is a pie chart, and the second one is a column chart.

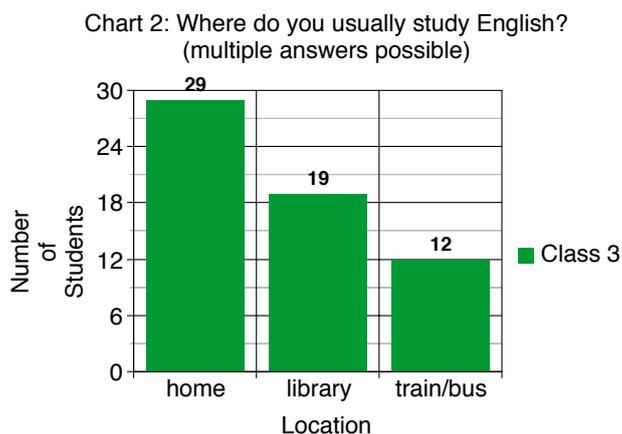
Example 1: A pie chart



Things to note:

1. The chart is numbered (Chart 1).
2. The chart has a label (How much do you enjoy sleeping in class?).
3. The legend is on the right hand side, and is labelled (not at all, somewhat, a lot, very much). Note that these labels do not use capital letters.
4. The number of responses is written outside the pie chart (5, 3, 16, 21). Note that you could write the percentages (%) as well as the numbers.
5. The source of the data is written at the bottom (Source: Survey – question 7).
6. The number of responses for that question is written (n=45).

Example 2: A column chart



Source: Survey - question 10 (n=43)

Things to note:

1. The chart is numbered (Chart 2).
2. The chart has a label (Where do you usually study English?).
3. The legend is on the right hand side, and is labelled (Class 3).
4. The number of responses is written outside the top of each column (29, 19, 12). Columns are organized from left to right from the largest (29) to the smallest (12). Note that you could write the percentages (%) as well as the numbers.
5. The source of the data is written at the bottom (Source: Survey – question 10).
6. The number of responses for that question is written (n=43).
7. Each axis is labelled. Use capital letters for axis labels (Location) but not for items (home).

Presenting Data Effectively

How do you create these charts?

You can produce charts easily using Excel or Word, or applications on tablet computers. Another simple way is at this website: <http://nces.ed.gov/nceskids/createagraph/>

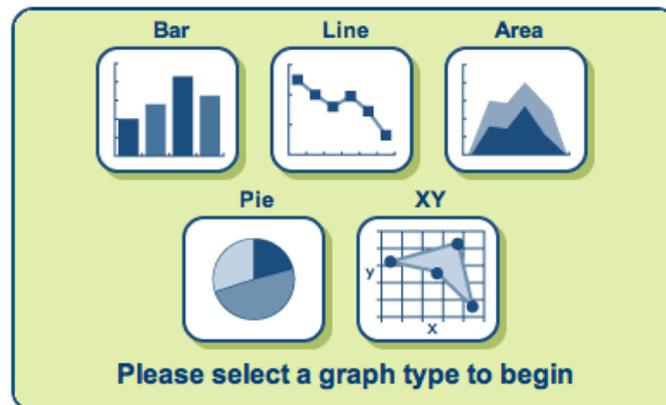
Creating graphs here is an easy step-by-step process. It's very simple to use – you can learn to use it by yourself without reading the following explanation. However, if you are the type of person who likes to read the manual before you drive, then you might find this explanation useful.

If you get lost, there are explanations of terms in the left hand tabs and a 'create a graph tutorial'.

To illustrate this site, this guide will walk you through making the column chart from Example 2. This chart took just a few minutes to make.

1. Select your chart:

First, select the type of chart you want to create: bar, line, area, pie, or XY.



Simply click on the icon of chart that you want to make. But which chart should you use?

Bar charts: best for showing totals

- a) As just mentioned, use a column chart if there are more than about five options.
- b) Use a column chart if you want to clearly show the total number of responses to a question.
- c) Also, if students can choose more than one answer (e.g. Where do you usually study English? multiple answers possible), use a column chart.

Line charts: best for showing changes over time

For example, for showing how test scores change over time.

Pie charts: best for showing proportions

- a) For scale questions (e.g. strongly agree, agree, disagree, strongly disagree).
 - b) For questions where you want to show how many students chose an answer when they could only choose one answer (e.g. student's gender, homeroom teacher, student's favourite book, number of hours studying English outside class a week).
- However, if you have more than about five slices in a pie it becomes difficult to read, so use a column or bar chart instead.

XY charts: best for showing relationships between X values and Y values

For example, to show test scores for individual students use a scatter or bubbles graph. This can illustrate whether these scores cluster together, and where they do so.

Note that this website does not calculate the relationships, it only displays the data that you put in.

Presenting Data Effectively

2. Design:

This tab automatically appears when you click on the chart you have chosen to create.

The screenshot shows the 'CREATE A GRAPH' software interface. At the top, the title 'CREATE A GRAPH' is displayed in a stylized, colorful font. Below the title, there are two main panels. The left panel is titled 'Help' and 'Examples'. It contains a question mark icon and text explaining that graphs and charts are used to communicate information visually. It also mentions that NCES uses graphs and charts in its publications and on the web. A link to 'Create A Graph Tutorial' is provided. The right panel is titled 'Design' and is currently selected. It shows a preview of a bar chart and various options for customizing it. The options include: 'Direction' (Vertical, Horizontal, True 3D, Stacked), 'Shape' (Rectangle, Cylinder, Triangle, Rhombus, Pattern), 'Style' (Background Color, Grid Color, Grid Lines: 6), 'Appearance' (2D), and 'Legend' (position right). On the far right, there are vertical tabs for 'Design', 'Data', 'Labels', 'Preview', and 'Print / Save'. At the bottom, there are two buttons: 'Start Over' and 'Update'.

On this tab, you choose the basic design of your graph.

For a column chart, you can choose the direction of the columns, and whether to 'stack' them or not.

You can also choose their shape and whether you would like them in a pattern (colour is the default).

For other types of chart, there are different choices offered.

When you have finished, click on the 'Data' tab on the right hand side. You do not need to click on 'Update'.

Presenting Data Effectively

3. Data:

If you haven't already done so, click on the 'Data' tab on the right hand side.

CREATE A GRAPH

Help
Graph Title: appears at the top of the graph and should describe the graph
Source: appears at the bottom of the graph and can be used to give credit to author of the data

Examples
Data Set: this defines the number of items and groups of items
Items & Groups: graphs consist of a series of data items, some in multiple groups.
Min & Max Values: limits the scale of the graph

Design
Graph Title: Chart 2: Where do you usually study English? (n=43)
↔ X Axis Label: Location
↕ Y Axis Label: Number of Students
Source: Source: Survey - question 10 (n=43)

Data
Data Set: Items 3 Groups 1

Labels
Group 1
Group Label: Class 3
Color:

Item Label	Value
Item 1: home	29
Item 2: library	19
Item 3: train/bus	12

Min-Value: 0
Max-Value: 30

NOTE: Values may only be numbers.

Preview
Print/Save

Start Over Update

In the top panel, write the graph title. Remember to write a chart number (e.g. Chart 2). Capitalize only the first word of the question or statement afterwards. For example:

Chart 2: Where do you usually study English?

Chart 2: Where students usually study English

If students could choose more than one answer, state that here (i.e. multiple answers possible).

Then, write the X Axis and Y Axis labels. Capitalize the first letter of each word (Number of Students).

Then, state the source. Remember to write the survey question number (Source: Survey – question 10) and the number of students who answered that question (n=43).

Next, specify the dimensions of your data set - the number of items (in this case, 3: home, library, train/bus) and the number of groups (only one class, so 1). However, if you want to 'stack your columns' and add more classes, you can increase the number of groups.

Then, write the names of the items (home, library, train/bus) and input the data (29, 19,12). Note that you cannot input both numbers and percentage - choose one. You can calculate the percentage using a calculator.

Finally, decide the minimum and maximum value for your Y axis. The maximum value must be bigger than your highest data (i.e. greater than 29 in this case).

Presenting Data Effectively

4. Labels:

Next, click on the 'Labels' tab on the right hand side.

Help Choosing the right look and feel is important when designing a graph.

Examples

- Show Labels:** displays the values on the graph
- Type:** is the data-specific value shown with each label
- Prefix:** is added to the beginning of a data label, such as (\$)
- Suffix:** is added to the end of a data label, such as (lbs, kg, cm, ft, ♦, %)
- Position:** where the data labels are displayed on the graph
- Label Color:** the color of the data labels
- Background Color:** the color behind the data labels. By default the background is transparent.

Font: sets the font style for all text and values in the graph
Font Color: the color of all text and values
Font size: the font size of all text and values

Data Labels: Show Label: yes no

Type: value Prefix: Suffix:

Position: Outside Top Font Size: 18 pt

Label Color: Background Color:

Fonts:

- ABC abc 123

Font Color: Font Size: 22 pt

Start Over Update

This tab really only helps you decide what your labels will look like.

The best font size for numbers printed on the chart (29, 19, 12) is usually font size 18. Select that in the top part in the 'Data Labels' section.

You can also choose the position of the numbers on the chart – in this case, on the outside at the top is easiest to read.

The best font size for the other information in your chart is 22, and choose this in the bottom section. This sets the font size for the chart title (Chart 2), the X and Y axes (Number of Students, Location), the items (home, library, train/bus), the legend (Class 3) and the source (Source: Survey – question 10).

Presenting Data Effectively

5. Preview:

Click on the 'Preview' tab on the right hand side.

CREATE A GRAPH

Help *Graph Preview:* shows you the current state of your graph. To make changes, click the *Design*, *Labels*, and *Data* tabs. To print or download this graph, click the *Print/Save* tab.

It is recommended that you have [Macromedia Flash Player](#) installed for the best quality preview with the fastest loading time.

Get macromedia
FLASH PLAYER

Design

Data

Labels

Preview

Print / Save

Chart 2: Where do you usually study English?
(multiple answers possible)

Location	Number of Students
home	29
library	19
train/bus	12

Source: Survey - question 10 (n=43)

Design

Data

Labels

Preview

Print / Save

Start Over

Update

This tab helps you check to see what your chart looks like.

If you want to edit anything, click on the tab on the right hand side that you want to change. For example, if you want to change the data you have input, click on 'Data'; if you want to change the location or the font size of the labels, click on 'Labels'.

Remember that the labels you wrote are actually in 'Data'; only the size and location of the labels is in 'Labels'.

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Presenting Data Effectively

6. Print / Save:

Click on the 'Print/Save' tab on the right hand side.

The screenshot shows the 'CREATE A GRAPH' website interface. At the top, the logo 'CREATE A GRAPH' is displayed in a stylized, colorful font. Below the logo, there are several tabs on the right side: 'Design', 'Data', 'Labels', 'Preview', and 'Print / Save'. The 'Print / Save' tab is currently selected and highlighted in blue. On the left side, there are two tabs: 'Help' and 'Examples'. The 'Help' tab is selected, showing instructions for starting a new graph, erasing data, copying to a new graph, printing, downloading, and emailing the graph. The 'Examples' tab is also visible. The main content area is divided into sections: 'Project Tools' with links for 'Start a new graph', 'Erase this graph', and 'Copy to new graph'; 'Print' and 'Download' options with icons of a printer and a CD/DVD; 'Email this graph' with a radio button for 'HTML' (selected) and 'Text', a text input field for the email address (containing 'robertcroker@mac.com'), and a 'Send' button; and a 'Lost a graph?' link. At the bottom, there are two buttons: 'Start Over' and 'Update'.

You can print out the chart directly – click on 'Print'. From here, you could also save your chart as a pdf on Macs.

Alternatively, you could download your chart as a pdf or png – click 'Download'.

You can also email the graph to your email account – and then go back and edit it later, which is very handy. In that case, write your email address in the box, and then press send.

If you would like to start creating a new chart, press on the 'Start Over' at the bottom of the page.

Final Words:

After you have done all the work of writing and editing your questionnaire and then analyzing your data, it is worthwhile taking a few more minutes to present your data in a visual form. Simple, clear charts will help other teachers and your own students understand your data more quickly and completely.

The website introduced here is run by the U.S. National Center for Education Statistics, and is one of the easiest ways of creating charts. However, if you are not sure what to do, look at information on the 'Help' tab on the left hand side.

Best of luck with your chart making! Robert Croker