

# TIP SHEET: REPORTING QUANTITATIVE DATA

Once you have collected data, you need to decide how to communicate that data to others. In the case of quantitative data, it is important to remember that numbers are not meaningful on their own. They need to be presented clearly and placed in a context that makes sense to an audience.

## GENERAL PRINCIPLES

When reporting quantitative data, keep the following general principles in mind:

- **Balance narrative with evidence.** Use numbers to illustrate a point, but explain the point you are making using words. It can be tempting to let numbers “speak for themselves,” but it is helpful for your audience if you add some narrative.
- **Use tables, charts, and graphs appropriately.** These should be used when they clarify or illustrate a point better than words alone. Tables, charts, and graphs should be self-explanatory, but should also be referenced in the text of a report. Finally, use the right kind of visual display for your data (see the examples below).
- **Be careful about claims.** In a typical evaluation, it is almost never appropriate to claim that a relationship – e.g. between program participation and outcomes – is causal. Rather than saying “program X improves math scores,” stick with a more strictly accurate statement, such as “youth who attend program X more than 80% of the time showed stronger gains on math assessments than youth who attended less than 20% of the time.”

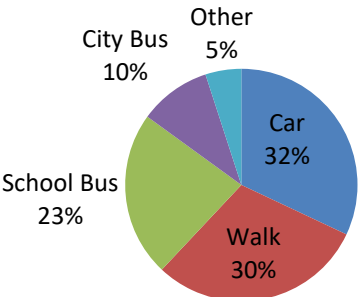
## BASIC DESCRIPTIVE STATISTICS

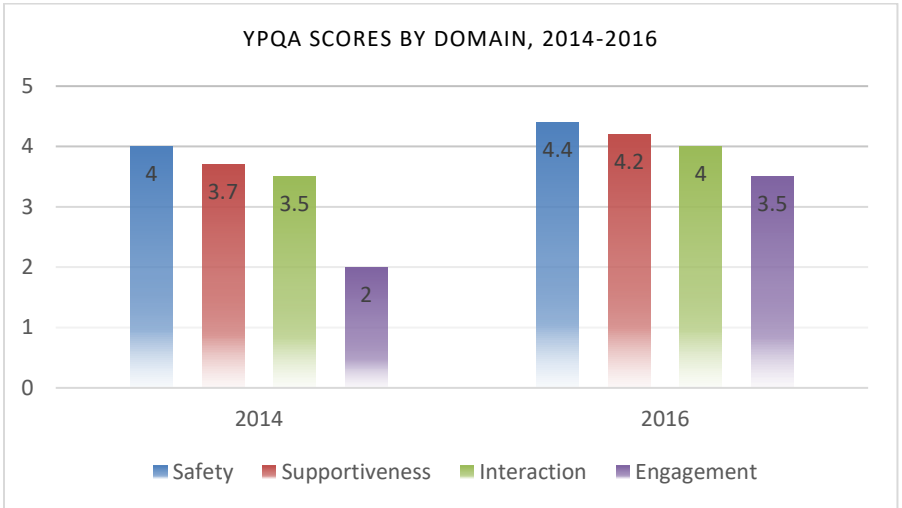
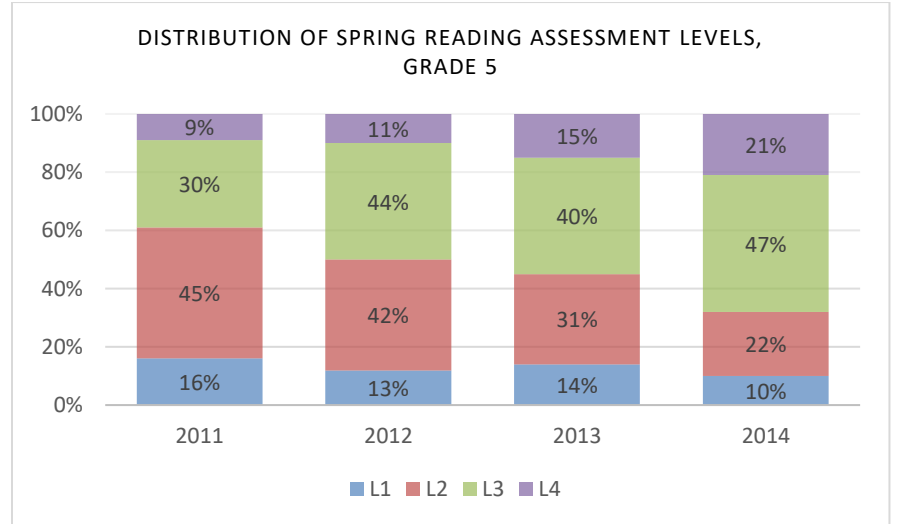
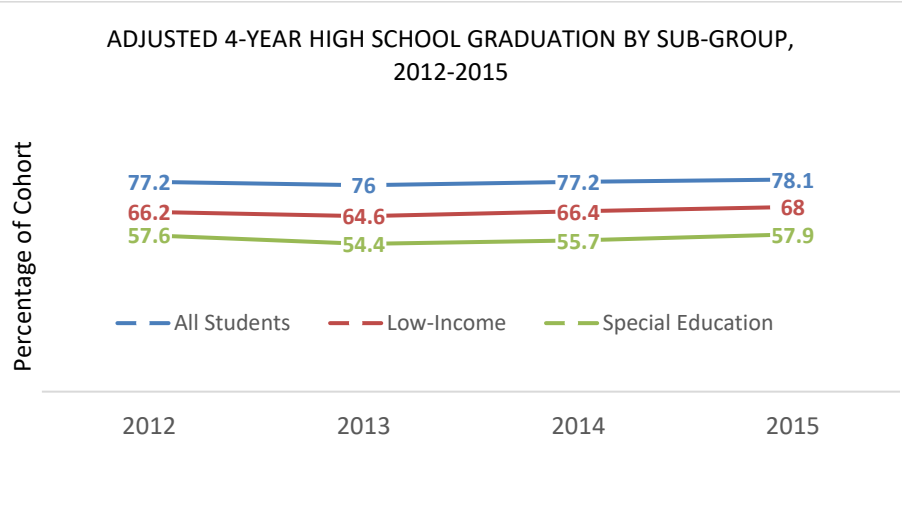
Unless you are conducting a research study or a very rigorous impact evaluation, you will mainly be working with descriptive statistics, or statistics that summarize data. The main statistics used in evaluations are:

- **Frequencies**, which show how often data fall into certain categories.
- Measures of **central tendency** such as the **mean** (average value of a set of numbers), **median** (middle value in a set of numbers), and **mode** (most common value in a set of numbers).
- Measures that show how your data is distributed (or **spread**). These include **standard deviation** (basically how tightly clustered your data is around the mean), **ranges**, which show the distance between the smallest and the largest values in a data set, and **quartiles**, which divide data sets into quarters.

## BASIC DATA DISPLAY EXAMPLES

The examples shown below are ones that can easily be produced using most versions of Microsoft Excel.

TYPE	WHEN TO USE IT	EXAMPLE												
<b>Pie Chart</b>	Use pie charts when you want to show parts of a whole, and have a relatively small number of parts that do <i>not</i> have an implicit order (i.e. most-to-least, best-to-worst).	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>TYPICAL AFTER-SCHOOL TRANSPORTATION, SCHOOL X</p>  <table border="1" style="margin: 0 auto; border-collapse: collapse;"> <caption>Transportation Data</caption> <thead> <tr> <th>Mode</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Car</td> <td>32%</td> </tr> <tr> <td>Walk</td> <td>30%</td> </tr> <tr> <td>School Bus</td> <td>23%</td> </tr> <tr> <td>City Bus</td> <td>10%</td> </tr> <tr> <td>Other</td> <td>5%</td> </tr> </tbody> </table> </div>	Mode	Percentage	Car	32%	Walk	30%	School Bus	23%	City Bus	10%	Other	5%
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<p><b>Bar Chart</b></p>	<p>Use bar charts to compare categories of data. Bar charts can be displayed vertically or horizontally; time series data is normally displayed vertically. Grouped bar graphs show more than one type of data in each category (see example).</p>	 <p>YPQA SCORES BY DOMAIN, 2014-2016</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Safety</th> <th>Supportiveness</th> <th>Interaction</th> <th>Engagement</th> </tr> </thead> <tbody> <tr> <td>2014</td> <td>4</td> <td>3.7</td> <td>3.5</td> <td>2</td> </tr> <tr> <td>2016</td> <td>4.4</td> <td>4.2</td> <td>4</td> <td>3.5</td> </tr> </tbody> </table>	Year	Safety	Supportiveness	Interaction	Engagement	2014	4	3.7	3.5	2	2016	4.4	4.2	4	3.5										
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<p><b>Stacked Bar Chart</b></p>	<p>Like grouped bar charts, stacked bar charts are used when you want to show more than one type of data per category; stacked bar charts are specifically used to show parts of a whole. The example here uses percentages, so the stacks are the same height.</p>	 <p>DISTRIBUTION OF SPRING READING ASSESSMENT LEVELS, GRADE 5</p> <table border="1"> <thead> <tr> <th>Year</th> <th>L1</th> <th>L2</th> <th>L3</th> <th>L4</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>16%</td> <td>45%</td> <td>30%</td> <td>9%</td> </tr> <tr> <td>2012</td> <td>13%</td> <td>42%</td> <td>44%</td> <td>11%</td> </tr> <tr> <td>2013</td> <td>14%</td> <td>31%</td> <td>40%</td> <td>15%</td> </tr> <tr> <td>2014</td> <td>10%</td> <td>22%</td> <td>47%</td> <td>21%</td> </tr> </tbody> </table>	Year	L1	L2	L3	L4	2011	16%	45%	30%	9%	2012	13%	42%	44%	11%	2013	14%	31%	40%	15%	2014	10%	22%	47%	21%
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<p><b>Line Graph</b></p>	<p>Use line graphs to illustrate trends. Line graphs can show how one or more variables change over the same period of time.</p>	 <p>ADJUSTED 4-YEAR HIGH SCHOOL GRADUATION BY SUB-GROUP, 2012-2015</p> <table border="1"> <thead> <tr> <th>Year</th> <th>All Students</th> <th>Low-Income</th> <th>Special Education</th> </tr> </thead> <tbody> <tr> <td>2012</td> <td>77.2</td> <td>66.2</td> <td>57.6</td> </tr> <tr> <td>2013</td> <td>76</td> <td>64.6</td> <td>54.4</td> </tr> <tr> <td>2014</td> <td>77.2</td> <td>66.4</td> <td>55.7</td> </tr> <tr> <td>2015</td> <td>78.1</td> <td>68</td> <td>57.9</td> </tr> </tbody> </table>	Year	All Students	Low-Income	Special Education	2012	77.2	66.2	57.6	2013	76	64.6	54.4	2014	77.2	66.4	55.7	2015	78.1	68	57.9					
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There are a number of other kinds of visualizations that one could use – these are the most basic. Also, remember that not all data lends itself to a chart or graph. Sometimes a table is the best way to show data, and sometimes narrative is sufficient. It depends on the purpose of your report, and its audience.