

Basic Graph Types

Terms

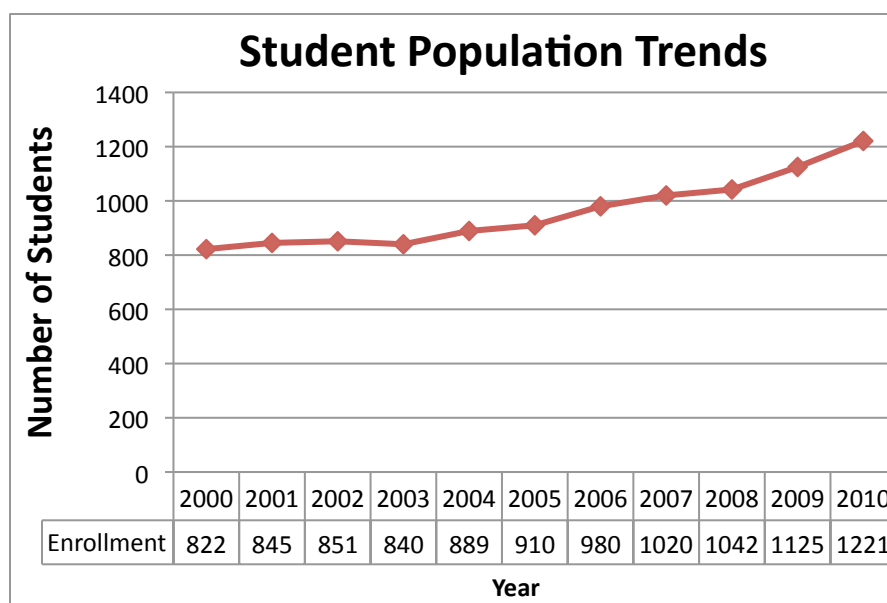
- Data Table—creates a table below the graph which shows the exact amount for each point.
- Data Label—creates a label by each point on the graph which shows the exact amount.
- Legend—identifies quantities that are compared with different colors. May be placed at various places around the graph.

Clearly identify the type of numbers that are used. Raw scores, percentages, percentiles, and NCE all represent different information.

Line Graph—is used to show trends in data over time. This could be assessment scores, population, funding, or many more. More than one quantity can be graphed and then compared. This graph shows a data table to show exact populations. The steeper the slope, the greater the change. Change can be either decreasing (negative) or increasing (positive).

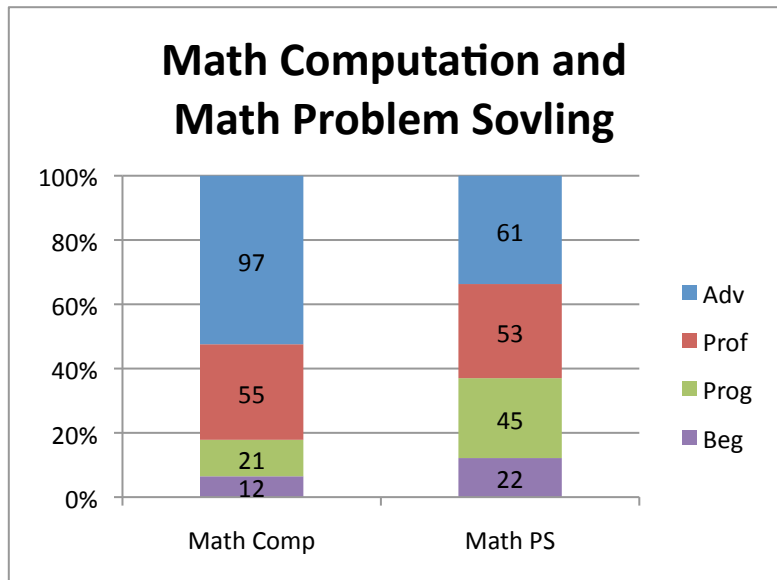
Be sure to

- Label vertical axis
- Label horizontal axis
- Place a title on the graph
- Don't try to place too much information in the graph or show too many comparisons.
- Use different colors if comparing different groups.



Bar Graph—is very similar to line graph except that bars are used to represent quantities. Time is not a factor so the order of the parts is not important. Many times they may be shown from high to low or low to high to identify factors which have a greater influence, growth, or decline.

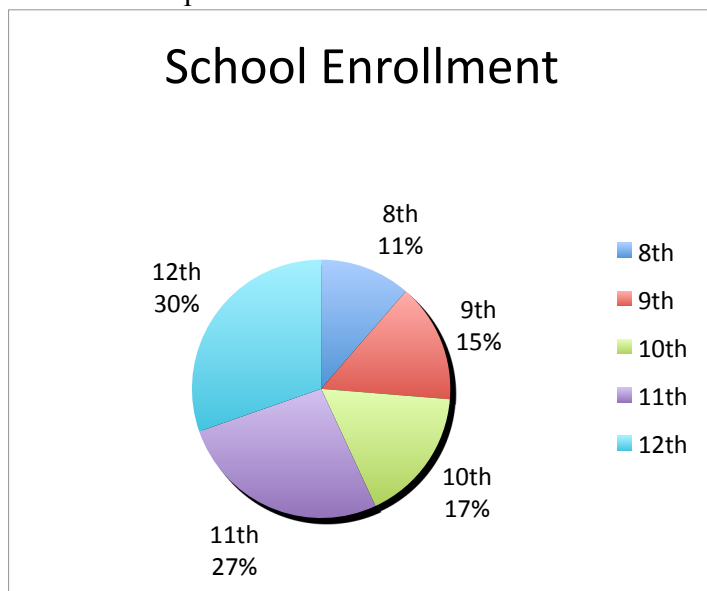
Stacked Bar Graph—is used to show how different attributes of the data stack up to each other as a part of the whole. Many times these are used to show the percentage of students that are achieving a specific level on a test. Different test can then be compared. Each bar represents 100%. In this particular graph it is easy to see that the percentage of students advanced in higher in math computation than in math problem solving and that more students are at the beginning level in problem solving than in computation.



Stacked bar graphs can also be used to look at disaggregation of data. Comparisons can be made of male/female, social economic status, race, special education, ELL and many more. When looking at subgroups different sized groups are compared. Be sure to look at the numbers as well as the percents. When comparing one teacher’s class of 22 students with the whole grade of 200 students, ten percent of the teacher’s class is 2 students and ten percent of the whole class is 20 students. Because the stacked bar graph represents percentage the length of the bar for each group would be the same.

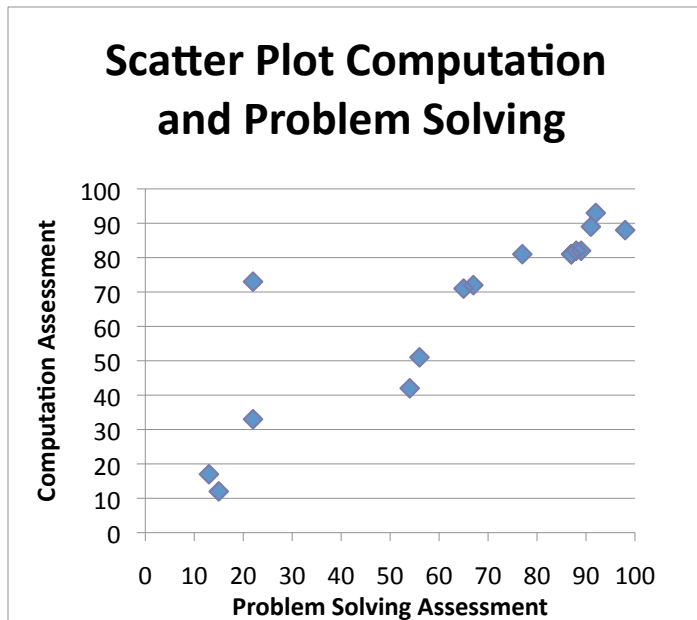
Circle graph or Pie Chart—is used to compare how much of a whole or 100% is distributed. This could show where money in the budget is spent, diversity of student populations, or years of teacher experience. Be sure to:

- Place a title on the chart
- Identify if the displayed numbers are percentages or number
- Don’t create too many pieces of the pie, consolidate smaller number into an “other category.”
- Pie graphs that are tilted or shown in 3-D may distort the relationship to the whole.



This also may happen with pieces that are highlighted or separated.

Paired Scatter Plot—is used to see if there is a relationship or correlation between two variables. This example with a couple of exceptions shows a correlation between computation and problem solving assessments. Other possibilities correlations pairs could be time spent reading and language arts achievement or attendance and overall achievement. The closer to a straight line formed by the points the better the correlation. Another example could compare the scores on a NRT test with scores on a state test. If the test correlation is high the NRT could be used as a predictor of how students will do on the state assessment.



Other possible correlations

- Number of absences and score on assessment
- Scores on analytic writing and state writing
- Parent attitude and student attitude
- Scores on NRT and state assessment
- Homework completed and grade in class
- Involvement in extra-curricular activities and grades in school

Other Graphs to Consider:

Pictographs—shows data using representative pictures. This is a variation from the bar graph.

Box and Whisker Plot—provides a visual display of data that easily compares groups and the spread of information. Reference points are provided for the high, low, 1st, 2nd, and 3rd quartiles. Unfortunately not widely used at this time.

Pareto chart—is used to represent the number of errors on questions as related to the total number of errors made. The left scale of the graph is the number of errors and the right scale represents the cumulative percent of errors made.

Radar graph—displays similar information to a line graph only as spokes of a wheel. It works best to compare different quantities.

DATA ANALYSIS

Scores for a particular test (Tera-Nova) or sub test (Mathematics, Math computation, Math problem solving) are placed in a chart as shown below. The scores shown would be a single score to represent the assessment for each grade level. This could be the average percentile, median score, or others as long as the type of scores used is the same.

The type of test is shown in the top row. Program data which show improvement of a particular program is shown by looking across the rows. Cohort data which shows performance from year to year is shown using the diagonals.

EPS Stanford Achievement Test Comparison of Group Percentile Rank Scores - Reading									
	Rdg '00	Rdg '01	Rdg '02	Rdg '03	Rdg '04	Rdg '05*	Rdg '06	Rdg '07	Rdg '08
Grd 3	62	61	71	66	71	68	74	75	76
Grd 4	70	68	69	74	71	75	76	74	80
Grd 5	70	69	71	70	73	74	76	76	77
Grd 6	68	66	69	70	69	71	68	75	75
Grd 7	64	65	67	66	69	67	69	68	71
Grd 8	65	62	70	67	66	72	69	71	73
Grd 9	62	60	57	61	64	76	72	71	76

Program Data

Cohort Data

*A new version of Stanford was administered in 05 - direct comparisons cannot be made

Graph notes:

- The graphs shown on the next pages are designed to show the various types of graphs and the information they reflect. Several items should be included when creating graphs for display including:
 - Graphs titles and labels on each axis.
 - Data Labels—adds the number students on the bar
 - Data Table—adds the number of students at the bottom of the graph.

A stacked bar graph is a good way to compare two assessment or subtest. It shows different groups (beg, prog, prof, adv) in one bar stacked on top of each other. If the stacked bar graph uses percents, the height of the bar graph will be the same for each assessment or subtest compared (100%) regardless of the number of students being shown. For stacked percent bar graphs it would be desirable to have the number in each section of the bar shown, data label, or create a data table which show the numbers below. A stack bar graph can also be created using the number of students in each level which would create bars of different heights but the comparisons between assessments is more difficult.

Looking at Trend Data With Different Assessments.

Data from 4th grade

8.2.1—percent of students proficient

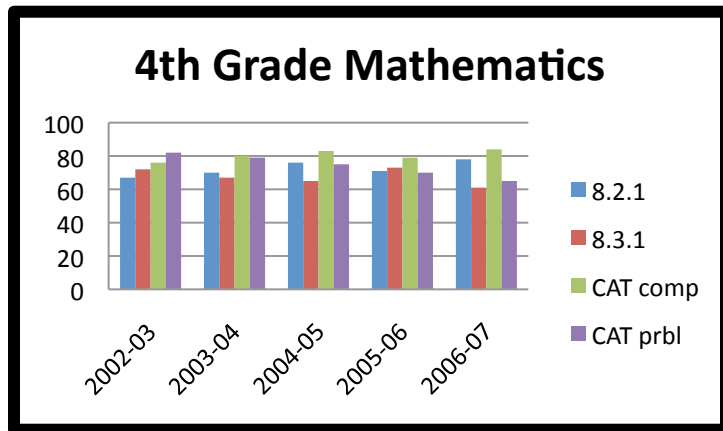
8.3.1—percent of student proficient

CAT Comp—average percentile scores from CAT test on math computation

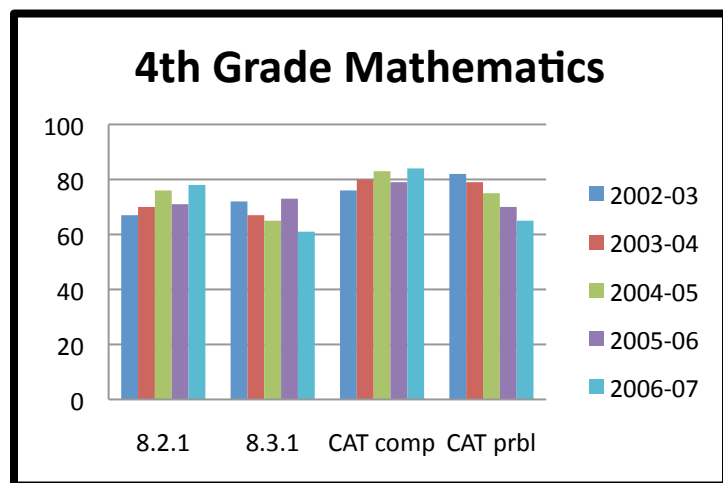
CAT Prbl—average percentile scores from CAT test on math problem solving

The totals column is not used in the graph.

	8.2.1	8.3.1	CAT comp	CAT prbl
2002-03	67	72	76	82
2003-04	70	67	80	79
2004-05	76	65	83	75
2005-06	71	73	79	70
2006-07	78	61	84	65



This graph shows the relationship between the various tests. By placing the test together it is easy to see if the test show similar results.



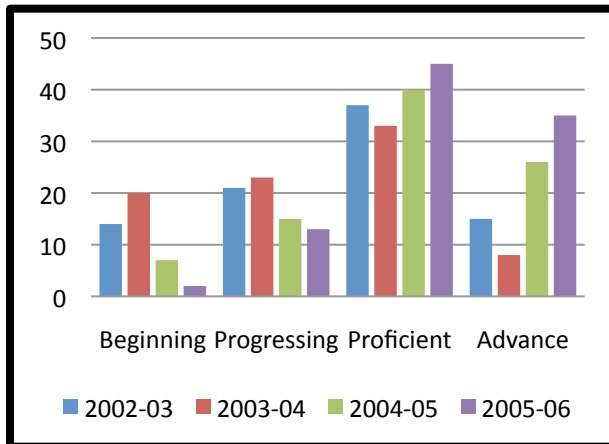
This graph uses the same data and is made by switching the rows and columns around and shows trend data over time. For example the CAT problem solving is showing a definite drop over time and 8.2.1 is show good improvement.

Trend Data with groups or ability levels for one standard or NRT sub-score.

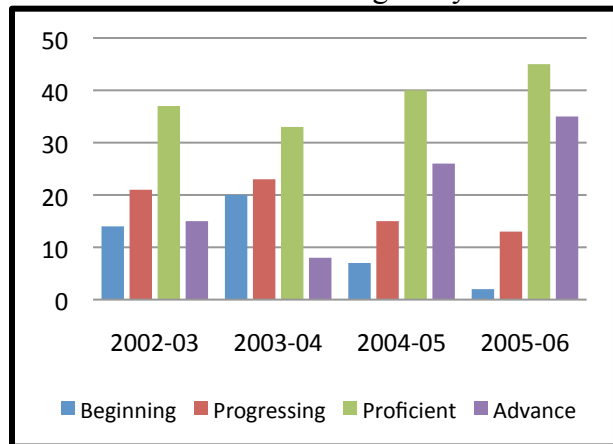
The totals column is not used in the graph.

	Beginning	Progressing	Proficient	Advance	Total
2002-03	14	21	37	15	87
2003-04	20	23	33	8	84
2004-05	7	15	40	26	88
2005-06	2	13	45	35	95

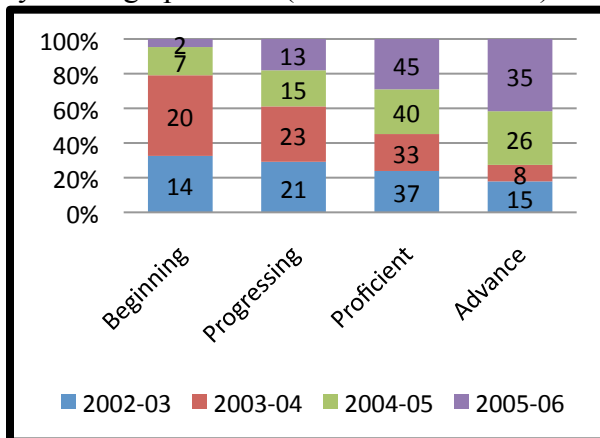
This graph shows the number at each level over time.



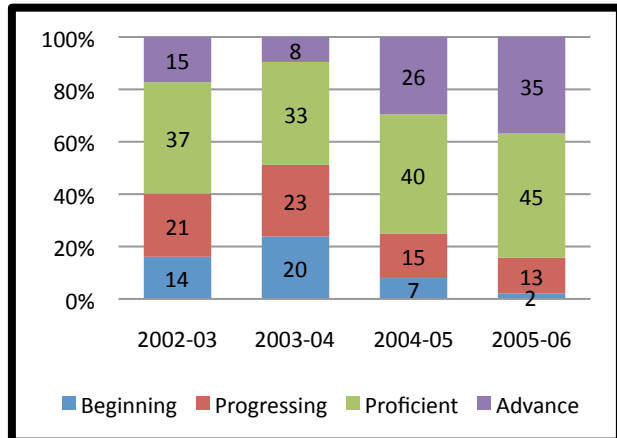
Switch the rows and columns shows the number at each level in a given year.



This is a stacked bar graph using the same information as above. Each bar show 100%, numbers on the bars reflect the NUMBER in each category. Improvement over time is shown by looking up the bar (2002-03 on bottom)



This stacked bar graph is using the same information as above. The rows and columns have been switched. Progress over time is shown by looking from bar to bar, beginning numbers are shown the bottom of each bar.



Compare two groups, with levels on several assessments

m—is male and f—is female

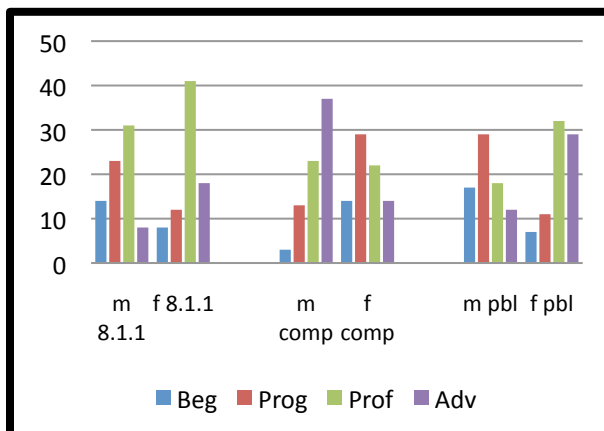
These graphs focus on the comparison between the two groups in one year. You may want to look at trend data for each group separately as shown on the previous page.

The total column is not used in the graph

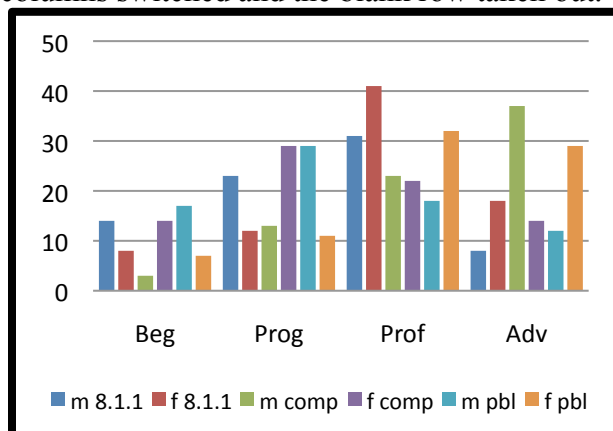
The blank row separates different assessments.

	Beg	Prog	Prof	Adv	total
m 8.1.1	14	23	31	8	76
f 8.1.1	8	12	41	18	79
m comp	3	13	23	37	76
f comp	14	29	22	14	79
m pbl	17	29	18	12	76
f pbl	7	11	32	29	79

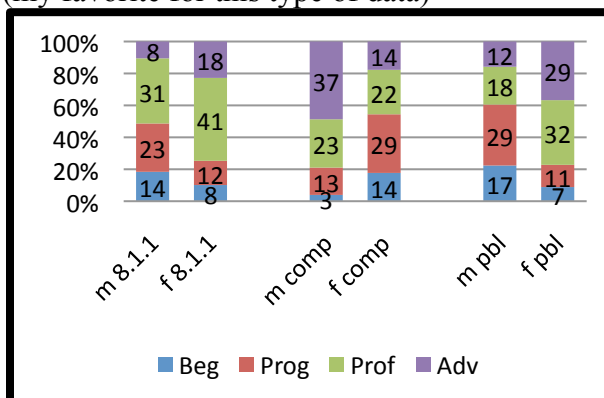
Bar graph of the table above.



Bar graph of the above table with rows and columns switched and the blank row taken out.



This stacked graph is of the chart above. Male and female can be compared side by side. (my favorite for this type of data)



Switch the rows and columns and delete the extra row from the chart. All of the beginning is in the first column. (I believe limited value)

