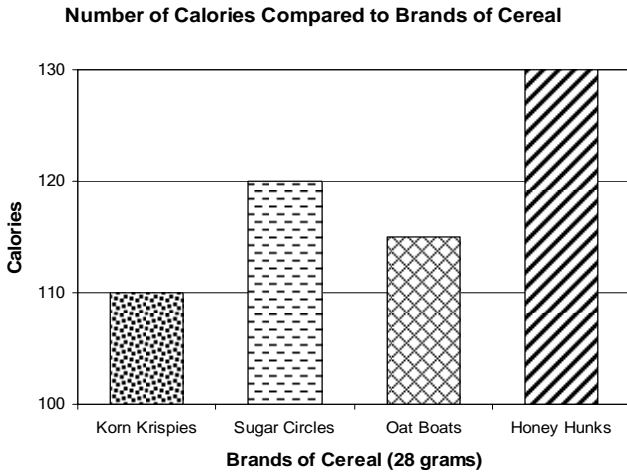


# Understanding Graphing Worksheet

Graphs appear not only in textbooks and scientific journals, but also in newspapers and popular magazines. They are useful because they clearly show relationships between two or more variables. Two of the most common graphs are bar and line graphs.

Bar graphs compare several variables according to one characteristic. For example, the bar graph below compares four kinds of cereal according to the number of calories each contains in 28 grams.



1. Look at the numbers used on the vertical axis. What would happen to the bars on the graph if these numbers were changed to 100, 150, 200, and 300?

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2. How would the graph change if the numbers on the vertical axis started with 0 and increased in increments of 10?

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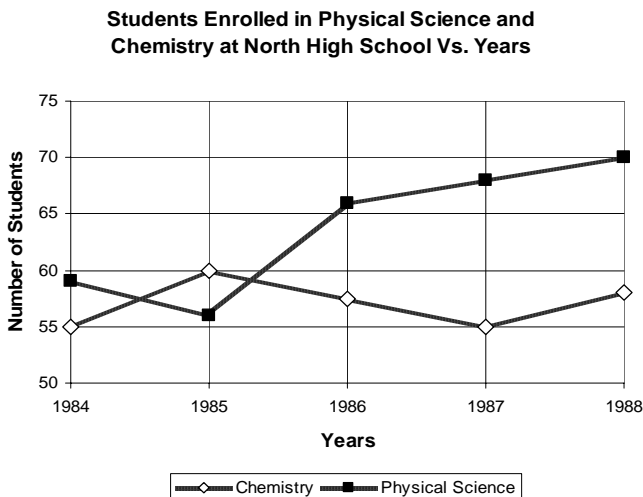


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Line graphs, such as the one below, show a change in one or more variables over time. They can also illustrate a trend.



3. How does the enrollment in physical science compare with that in chemistry over the years? Do you see any trends?

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4. Why does this graph include a legend?

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Notice that the independent variables in both graphs (the kind of Brands of Cereal and the Years) are plotted along the horizontal axis. Independent variables are chosen or changed by the experimenter. The dependent variables (the Number of Calories and the Number of Students) are plotted along the vertical axis. Dependent variables change when the independent variable changes. Notice, too, that both graphs include titles and labels for the variables.

To practice making a bar graph, let's compare the number of students in several high schools. **School A has 850, school B has 600, school C has 1200, school D has 900, and school E has 350.**

5. In a bar graph of these data, what would be the independent variable and on which axis would it be plotted?

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6. What would be the dependent variable and on which axis would it be plotted?

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We will have a fixed number of variables on the horizontal axis. However, we must establish an appropriate range of numbers for the vertical axis.

7. What is the highest and lowest number of students?

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8. Considering the range of numbers, what would be appropriate numbers to use on the vertical axis?

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**Now, on a piece of the graph paper, draw this bar graph.** Be sure to label the variables and give the graph a title. Draw in the bars and set them at the levels listed above.

9. How is comparing school enrollment in a graph better than just listing the numbers in a sentence?

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To practice making a line graph, let's say an optometrist has noticed an increase in the number of her patients requesting contact lenses. She wonders how this number compares with the number of people asking for glasses during the past five years. The chart below lists her raw data.

Year	Patients Wanting Glasses	Patients Wanting Contact Lenses
1984	37	42
1985	29	61
1986	32	74
1987	25	74
1988	17	86

10. In a line graph for these data, what would be the independent variable and on which axis would it be plotted?

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11. In a line graph for these data, what would be the dependent variable and on which axis would it be plotted?

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12. Considering the highest and lowest number of patients for each year, what numbers would be the most appropriate to list on the vertical axis?

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**On the back side of the graph paper, draw the line graph.** Be sure to label the variables and include a title. Use a legend to indicate each category of patient. Mark the points on the graph that show the number of patients who asked for glasses and number who requested contact lenses for each year.

Now connect the points that you have plotted in each category.

13. What trends does the graph indicate?

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You have just constructed two graphs. Being familiar with the construction of graphs will not only help you when making your own, it will help you understand those you encounter in everyday life.