From: http://misterguch.brinkster.net/graph.html

Mr. Guch's rules for Good Graph Making:

1. Always give your graph a title in the following form: "The dependence of (your dependent variable) on (your independent variable).

Let's say that you're doing a graph where you're studying the effect of temperature on the speed of a reaction. In this reaction, you're changing the temperature to known values, so the temperature is your independent variable. Because you don't know the speed of the reaction and speed depends on the temperature, the speed of the reaction is your dependent variable. As a result, the title of your graph will be "The dependence of reaction rate on temperature", or something like that.

2. The x-axis of a graph is always your independent variable and the y-axis is the dependent variable.

For the graph described above, temperature would be on the x-axis (the one on the bottom of the graph), and the reaction rate would be on the y-axis (the one on the side of the graph)

3. Always label the x and y axes and give units.

Putting numbers on the x and y-axes is something that everybody always remembers to do (after all, how could you graph without showing the numbers?). However, people frequently forget to put a label on the axis that describes what those numbers are, and even more frequently forget to say what those units are. For example, if you're going to do a chart which uses temperature as the independent variable, you should write the word "temperature (degrees Celsius)" on that axis so people know what those numbers stand for. Otherwise, people won't know that you're talking about temperature, and even if they do, they might think you're talking about degrees Fahrenheit.

4. Always make a line graph

Never, ever make a bar graph when doing science stuff. Bar graphs are good for subjects where you're trying to break down a topic (such as gross national product) into its parts. When you're doing graphs in science, line graphs are way more handy, because they tell you how one thing changes under the influence of some other variable.

5. Never, EVER, connect the dots on your graph!

Hey, if you're working with your little sister on one of those placemats at Denny's, you can connect the dots. When you're working in science, you never, ever connect the dots on a graph.

Why? When you do an experiment, you always screw something up. Yeah, you. It's probably not a big mistake, and is frequently not something you have a lot of control over. However, when you do an experiment, many little things go wrong, and these little things add up. As a result, experimental data never makes a nice straight line. Instead, it makes a bunch of dots which kind of wiggle around a graph. This is normal, and will not affect your grade unless your teacher is a Nobel prize winner. However, you can't just pretend that your data is perfect, because it's not. Whenever you have the dots moving around a lot, we say that the data is noisy, because the thing you're looking for has a little bit of interference caused by normal experimental error.

To show that you're a clever young scientist, your best bet is to show that you KNOW your data is sometimes lousy. You do this by making a line (or curve) which seems to follow the data as well as possible, without actually connecting the dots. Doing this shows the trend that the data suggests, without depending too much on the noise. As long as your line (or curve) does a pretty good job of following the data, you should be A-OK.

6. Make sure your data is graphed as large as possible in the space you've been given.

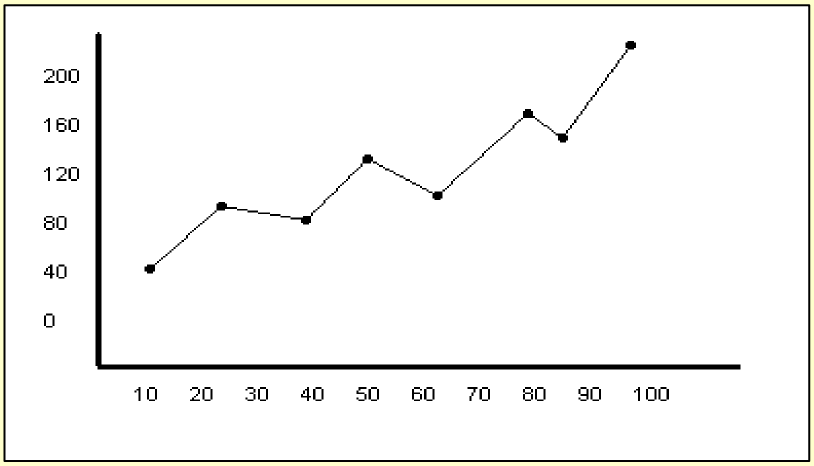
Let's face it, you don't like looking at little tiny graphs. Your teacher doesn't either. If you make large graphs, you'll find it's easier to see what you're doing, and your teacher will be lots happier.

So, those are the steps you need to follow if you're going to make a good graph in your chemistry class. I've included a couple of examples of good and bad graphs below so you know what these things are supposed to look like.

Examples of Good and Bad Graphs

All those rules I gave you above are true and are handy to know, but it's usually a bad idea to give rules without showing you what they mean. Below are two examples of graphs. One is a bad graph (which you may be guilty of making) and the other is a good graph (which is what I always make).

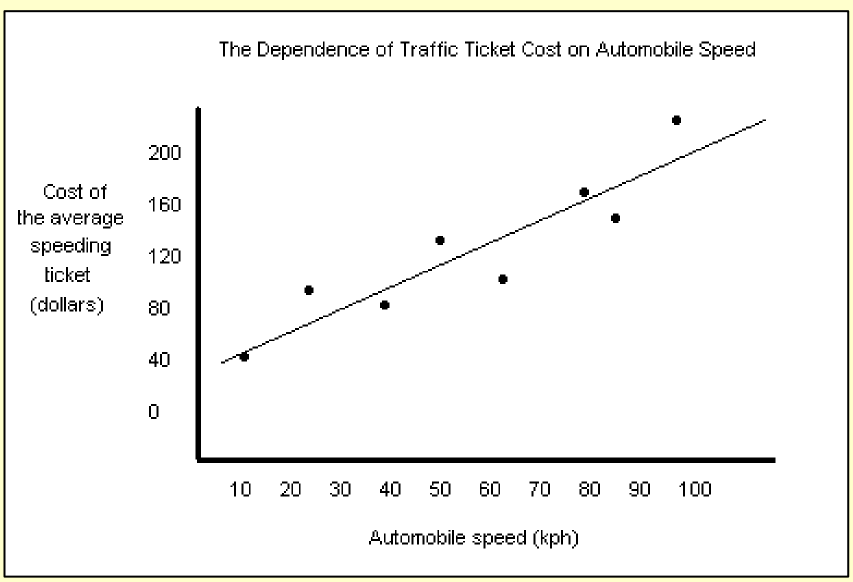
A bad graph!



Let's see what's wrong with this graph:

- There's no title. What's it a graph of? Who knows?
- There are no labels on the x or y axis. What are those numbers? Who knows?
- There are no units on the x or y axis. Is this a graph of speed in miles per hour or a graph of temperature in Kelvins? Who can tell?
- Somebody played "connect the dots". This should be a nice straight line which goes through the points or a curve that tends to follow them.

A good graph!



From: http://nces.ed.gov/nceskids/help/user_guide/graph/whentouse.asp

HOW TO CHOOSE WHICH TYPE OF GRAPH TO USE?

When to Use . . .

. . . a Line graph.

Line graphs are used to track changes over short and long periods of time. When smaller changes exist, line graphs are better to use than bar graphs. Line graphs can also be used to compare changes over the same period of time for more than one group.

. . . a Pie Chart.

Pie charts are best to use when you are trying to compare parts of a whole. They do not show changes over time.

. . . a Bar Graph.

Bar graphs are used to compare things between different groups or to track changes over time. However, when trying to measure change over time, bar graphs are best when the changes are larger.

. . . an Area Graph.

Area graphs are very similar to line graphs. They can be used to track changes over time for one or more groups. Area graphs are good to use when you are tracking the changes in two or more related groups that make up one whole category (for example public and private groups).

. . . an X-Y Plot.

X-Y plots are used to determine relationships between the two different things. The x-axis is used to measure one event (or variable) and the y-axis is used to measure the other. If both variables increase at the same time, they have a positive relationship. If one variable decreases while the other increases, they have a negative relationship. Sometimes the variables don't follow any pattern and have no relationship.