

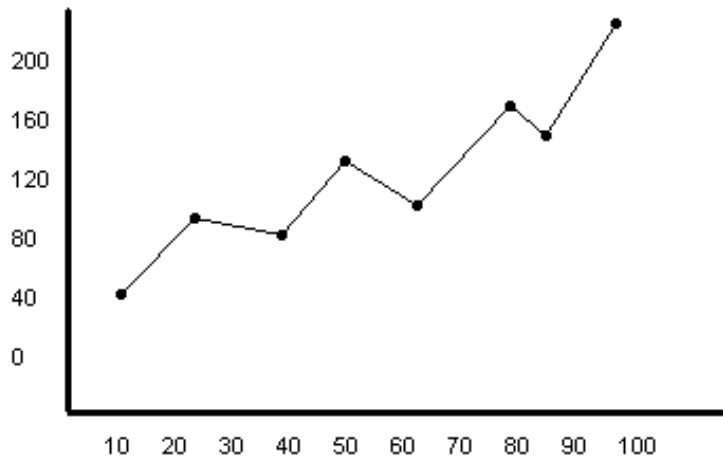
How to Construct a Line Graph

(You will always use a line graph in chemistry and physics.)

Step	What to Do	How to Do It
1	Identify the variables	<p>a. Independent Variable - (controlled by the experimenter, what you are doing)</p> <ul style="list-style-type: none">• Goes on the X axis (horizontal)• Should be on the left side of a data table. <p>b. Dependent Variable - (changes as a result of how you changed the independent variable – what happens as a result)</p> <ul style="list-style-type: none">• Goes on the Y axis (vertical)• Should be on the right side of a data table.
2	Determine the variable range.	<p>a. Subtract the lowest data value from the highest data value. (This is called the range.)</p> <p>a. Do each variable separately.</p>
3	Determine the scale of the graph.	<p>a. Divide the range of your scale (the highest data value) by the number of squares available to use. Then round up until you get a scale that will be easy to read.</p> <ul style="list-style-type: none">• Do each variable separately. <p>b. The numerical value for each square must be exactly the same on one axis, but each axis may be different.</p> <p>c. You may “break the line” on an axis if the lowest point of your scale is far from zero, but you must always start each axis at 0, 0.</p>
4	Draw each axis	<p>a. Spread the graph to use MOST of the available space. USE A RULER OR STRAIGHT EDGE to draw the lines for your graph</p> <ul style="list-style-type: none">• Leave about an inch margin to label each axis. <p>b. Label the major number increments on the axis, do not label each square.</p> <ul style="list-style-type: none">• Draw in the major tics, but use the graph paper markings for minor tics
5	Number and label each axis.	<p>a. Make sure to include both Quantity and Unit, example: Distance (meters)</p> <p>b. Place the label centered and below the x-axis and centered and to the left of the y-axis.</p>
6	Plot the data points.	<p>a. Plot each data value on the graph with a dark dot that is easy to see.</p> <p>b. Do not put the data number by the dot.</p>
7	Draw the graph.	<p>a. Draw a curve or a line that best fits the data points.</p> <p>b. Do not connect the dots! Draw a line through the points so there are points on the line, with the same number of points above the line as below it, if any.</p>
8	Title the graph.	<p>a. Title the graph using the format “Graph of Y vs. X (fill in the Y and X with the quantity on the Y and X axis.</p> <p>b. If your graph has more than one set of data, provide a “key” to identify the different lines.</p>

Examples of Good and Bad Graphs

A bad graph!

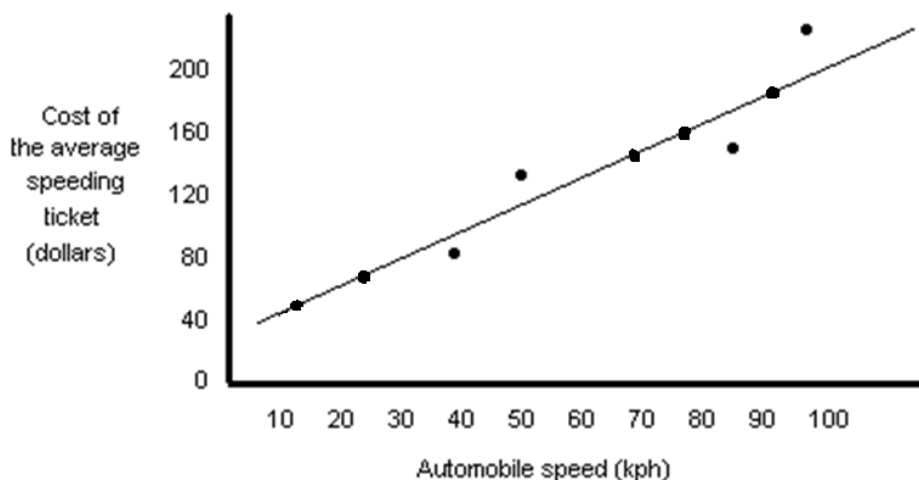


Let's see what's wrong with this graph:

- 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 Kelvin? 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!

The Dependence of Traffic Ticket Cost on Automobile Speed



- A pretty decent job! Doesn't the clarity and beauty of this graph just make you want to cry? It sure does make more sense than the first one!
- Your graphs will probably have the line drawn through zero, but not always.
- Also, I would have probably turned the label for the y-axis sideways, but all in all, a good graph.