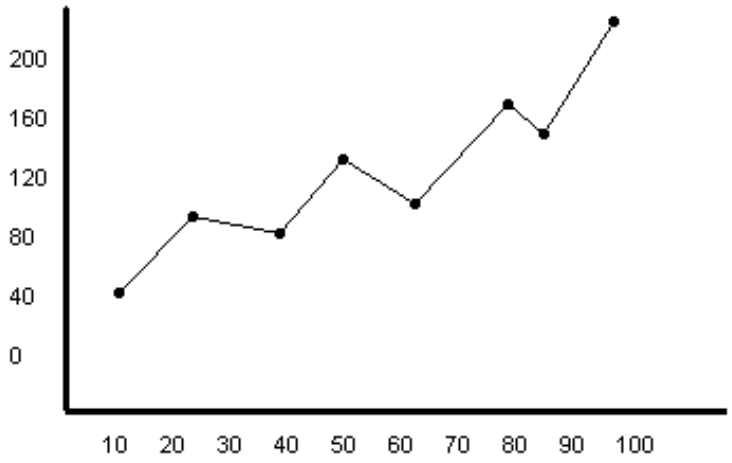
Checklist for a Good Graph

(You will always use a scatter plot chart in chemistry and physics.)

Checklist	What to Check
Identify the variables	a. **Independent Variable** - (controlled by the experimenter, what you are doing) • Goes on the x axis (horizontal) b. **Dependent Variable** - (changes as a result of how you changed the independent variable – what happens as a result) • Goes on the y axis (vertical)
Label each axis	a. Make sure to include both Quantity and Unit, example: Distance (m) • Use superscripts and subscripts where necessary for units and chemical formulas b. Place the label centered and below the x axis and centered and to the left of the y axis. c. Include major and minor gridlines, but only label the major gridlines on the axis with numbers, do not label each square.
Orientation	a. Make sure that the length of the x and y axes are proportionally correct in size when compared to each other b. Click on the graph and drag the sides to lengthen or shorten each axis to change the size. • Your graph should be oriented to take up a full page.
Good Scaling	a. Include both major and minor gridlines. b. Your graph should be easy to interpret. • One square or tic mark could represent 1, 2, 5, 10, etc., but it must be easy to interpolate and extrapolate c. The numerical value for each square must be exactly the same on one axis, but each axis may be different. You can have two different scales for the x and y axes. • The scale should NOT change along an axis – each square should have the same value c. Your graph must take up a full page. • Data should NOT be clumped in one region of your graph • Scale your graph so that the data is distributed across more than half the graph.
Choose a line of best fit	a. Choose a curve or a line that best fits the data points. b. Do not connect the dots! Choose a line that goes through the points so there are points on the line, with the same number of points above the line as below it, if any. c. For direct proportionalities, the line origin should come as close to 0,0 as possible. • Forecast your line "Backward" to achieve this
Data points	a. Use data point marks that are easy to see. b. Do not put the data number by the mark of the data point. c. If your graph has more than one set of data, provide a "key" to identify the different lines.
Title the graph	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.

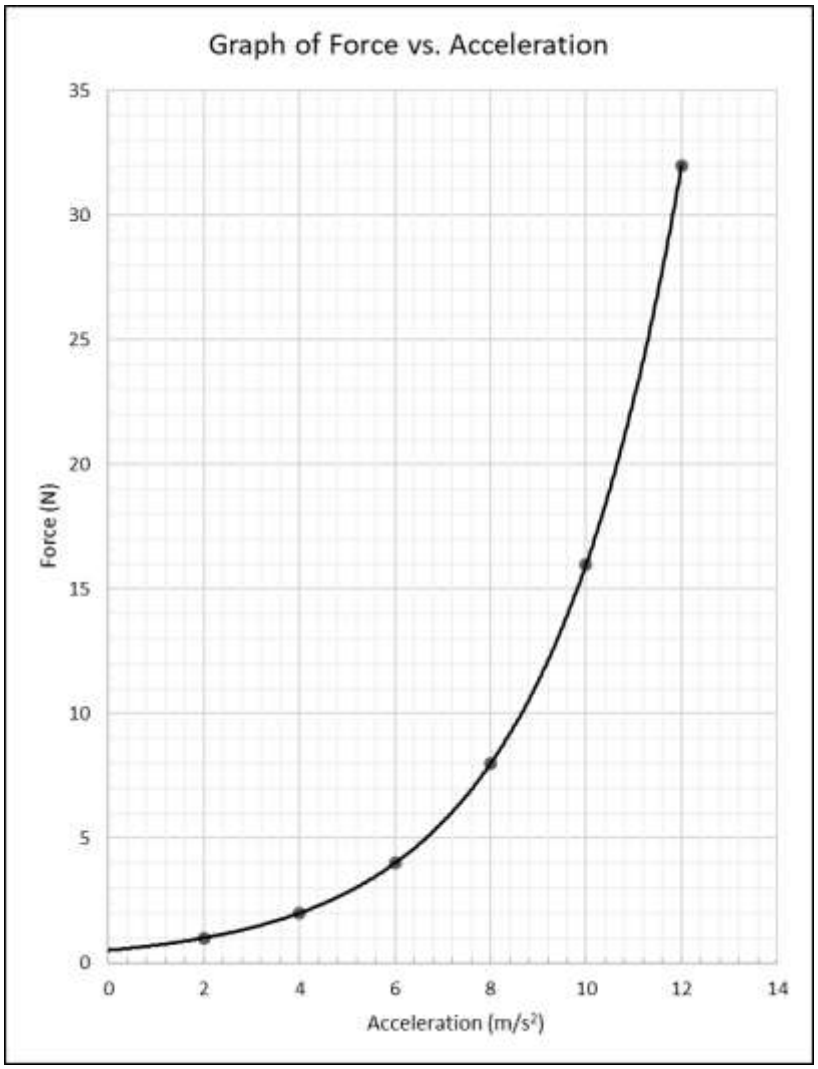
Examples of Good and Bad Graphs



A bad graph!

Let's see just some of what's wrong with this graph:

- There's no title. What's it a graph of?
- 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?
- The x and y axes are not sized proportionally.
- No gridlines so it's very hard to interpolate and extrapolate.
- 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!

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!

- There's a title and you can see right away what it's a graph of.
- The x and y axes are labelled with both the quantity and the unit.
- The x and y axes are sized proportionally.
- The data is distributed over the entire graph.
- There are major and minor gridlines so it's very easy to interpolate and extrapolate data.
- There is a line of best fit that clearly shows the relationship between the data.