

A picture, so they say, will tell a thousand words. But what about a graph or chart?

A good graph or chart can show as much as several paragraphs of words. But how do you choose which style of graph to use?

Find more at: <http://www.skillsyouneed.com/num/graphs-charts.html#ixzz4UD5sTsGP>

Types of Charts

The four most common are probably line graphs, bar graphs and histograms, pie charts, and Cartesian graphs.

You would use:

- **Bar graphs** to show numbers that are independent of each other. Example data might include things like the number of people who preferred each of Chinese takeaways, KFC and fish and chips.
- **Pie charts** to show you how a whole is divided into different parts. You might, for example, want to show how a budget had been spent on different items in a particular year.
- **Line graphs** show you how numbers have changed over time. They are used when you have data that are connected, and to show trends, for example, average night time temperature in each month of the year.
- **Cartesian graphs** have numbers on both axes, which therefore allow you to show how changes in one thing affect another. These are widely used in mathematics, and particularly in **Algebra**.

Axes

Graphs have two **axes**, the lines that run across the bottom and up the side. The line along the bottom is called the horizontal or **x-axis**, and the line up the side is called the vertical or **y-axis**.

- The **independent variable** is indicated on the **x-axis**. This is the variable/factor that you determine/change during your investigation.. You read it from the bottom left of the graph.
- The **dependent variable** is indicated on the **y-axis**, again starting from the bottom left of the graph.

Find more at: <http://www.skillsyouneed.com/num/graphs-charts.html#ixzz4UD66uW5m>

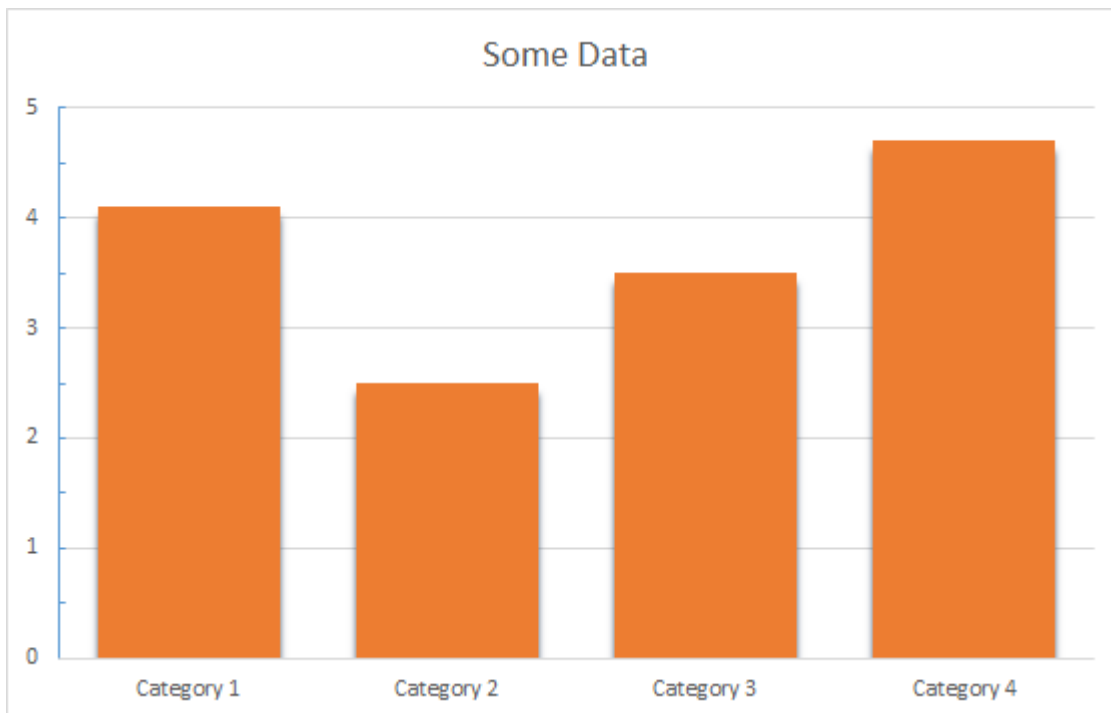
Bar Graphs and Histograms

Bar graphs generally have categories on the x-axis, and numbers on the y-axis. This means that you can compare numbers between different categories. The categories need to be independent, that is changes in one of them do not affect the others.

Here is a summary of 'some data' in a data table:

Some Data	
Category 1	4.1
Category 2	2.5
Category 3	3.5
Category 4	4.7

And the same data displayed in a bar chart:



Find more at: <http://www.skillsyouneed.com/num/graphs-charts.html#ixzz4UD6H1trU>

You can see immediately that this graph gives you a clear picture of which category is largest and which is smallest.

You can also use the graph to read off information about how many are in each category without having to refer back to the data table, which may or may not be provided with every graph you see.

In general, you can draw bar graphs with the bars either horizontal or vertical, because it doesn't make any difference. The bars **do not touch**.

A **histogram** is a specific type of bar chart, where the categories are ranges of numbers. Histograms therefore show combined continuous data.

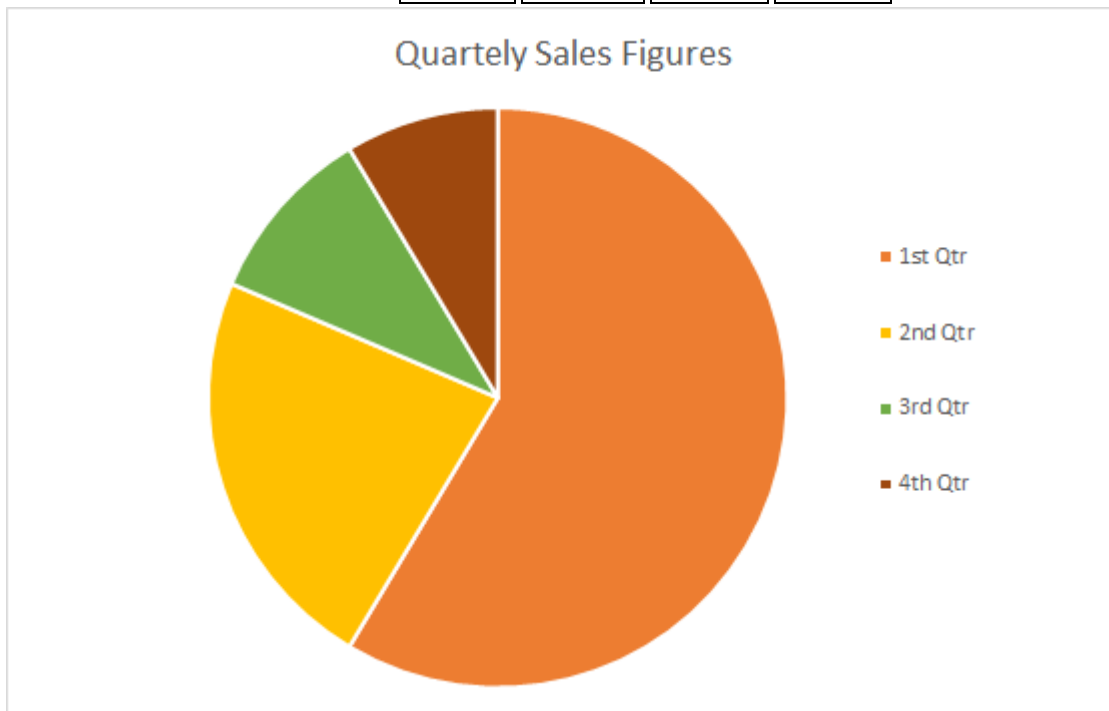
Find more at: <http://www.skillsyouneed.com/num/graphs-charts.html#ixzz4UD6M91xu>

Pie Charts

A pie chart looks like a circle (or a pie) cut up into segments. Pie charts are used to show how the whole breaks down into parts.

For example, this data shows the sales figures for a year, broken down by quarters:

Quarterly Sales Figures	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr
	8.2	3.2	1.4	1.2



From the pie chart you can see immediately that sales in Quarter 1 were much bigger than all the others: more than 50% of total annual sales.

Quarter 2 was next, with around one quarter of sales.

Without knowing anything more about this business, you might be concerned about the way that sales appeared to have dropped over the year.

Pie charts, unlike bar graphs, show **dependent data**.

Pie charts show percentages of a whole - your total is therefore 100% and the segments of the pie chart are proportionally sized to represent the percentage of the total. For more on percentages see our page: [Introduction to Percentages](#).

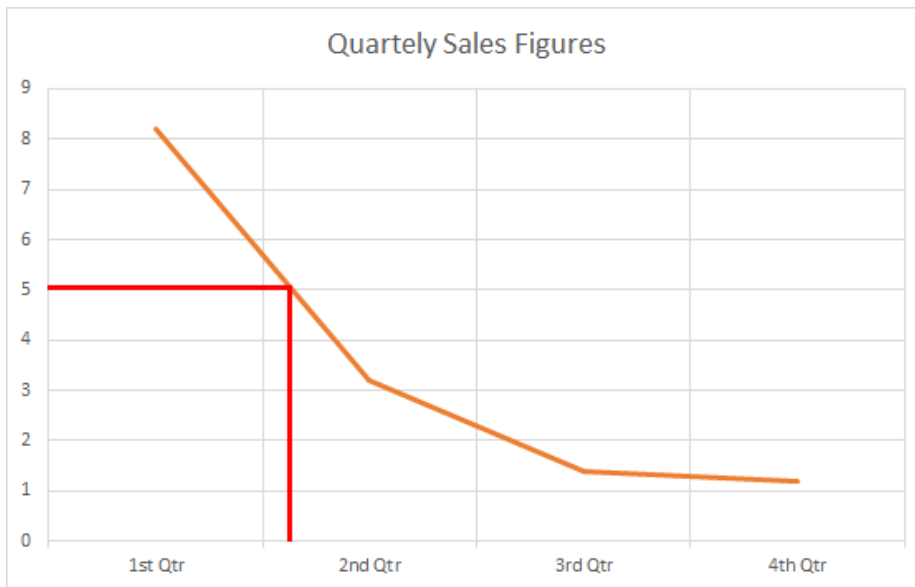
Usually it is not appropriate to use pie charts for more than 5 or 6 different categories. Lots of segments are difficult to visualise and such data may be better displayed on a different type of chart or graph.

Find more at: <http://www.skillsyouneed.com/num/graphs-charts.html#ixzz4UD6gKZRR>

Line Graphs

Line graphs are usually used to show **dependent data**, and particularly trends over time.

Line graphs depict a point value for each category, which are joined in a line. We can use the data from the pie chart as a line graph too.



You can see even more obviously that sales have fallen rapidly over the year, although the slow-down is levelling out at the end of the year. Line graphs are particularly useful for identifying the point in time at which a certain level of sales, revenue (or whatever the y value represents) was reached.

In the example above, suppose we want to know during which quarter sales first fell below 5. We can draw a line across from 5 on the y-axis (red line on the example), and see that it was during quarter 2.

Find more at: <http://www.skillsyouneed.com/num/graphs-charts.html#ixzz4UD6qb3py>

Remember:

- A graph is a “picture” of the results of your experiment / research / investigation.
- To understand the graph the heading must be clear and explaining exactly what the graph represents. The independent and dependent variable must be used.
- Both axis must always be labelled indicating the variable plus unit in brackets. E.g. velocity (m.s^{-1}) or Force (N)
- The independent variable is indicated on the x-axis and the dependant variable on the y-axis.
- Values on both axis must be in the same interval e.g. factors of the same number 10, 20, 30, 40 ... This is not necessary the values as in the table.



Activity 1:

1. Draw a line graph for the following information gathered in table 1:

Table 1: The change in current as the potential difference increases in the circuit.

	Potential difference (V)	Current (A)
1	1.5	1
2	3	2
3	4.5	3
4	5	4
5	6.5	5
6	8	6

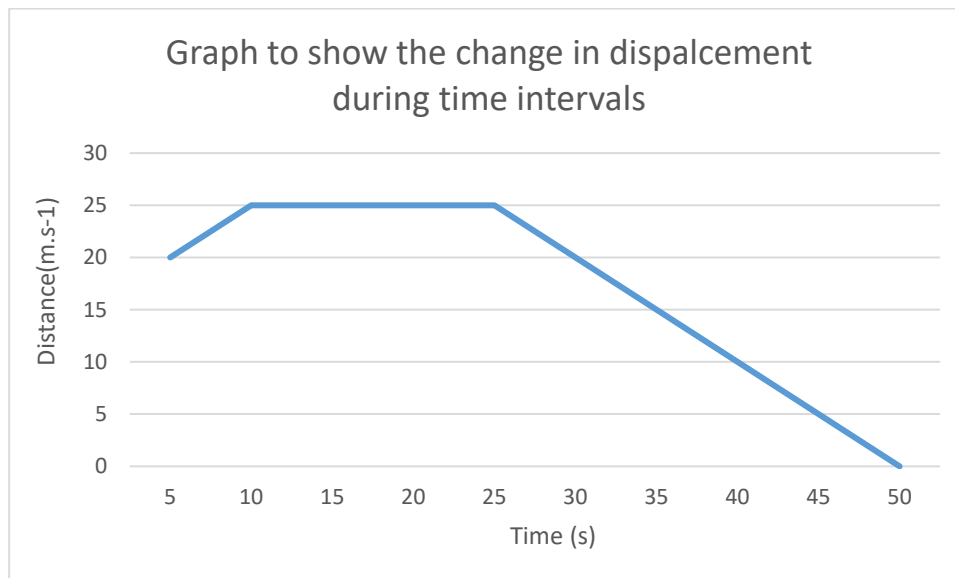
The unit is indicated in the table with the heading. We do not write it again with each value



2. What is the dependent variable in the experiment?
3. What is the independent variable in the experiment?
4. Draw a conclusion from the results.
5. Calculate the gradient of the graph.
6. What is the unit for the gradient? Clue: $R = \frac{V}{I}$
7. What is represented by the gradient?

Activity 2:

Study the following velocity time graph:



$$\text{Gradient} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$



Use 0 as reference point and answer the questions:

1. What is the y-intercept?
2. What is indicated by the y-intercept??
3. What can you tell about the motion between time
 - a. 10s to 25s?
 - b. 0 to 25s?
 - c. 25s to 50s?
4. During which time interval was the fastest motion?
5. Calculate the gradient for the first 10 seconds of the motion.
6. What is the unit for the gradient?
7. What is represented by the gradient of this distance – time graph?

'n Prentjie kan jou 'n storie met duisend woorde vertel. Maar wat vertel 'n grafiek jou?

'n Goeie grafiek kan vir jou dieselfde info gee as verskeie paragrawe met baie woorde. Maar hoe weet ek watter grafiek om wanneer te gebruik?

Vind meer uit by: <http://www.skillsyouneed.com/num/graphs-charts.html#ixzz4UD5sTsGP>

Tipe grafieke:

Die mees algemene grafieke is: lyngrafiek, kolomgrafiek of histogramme, sirkel grafiek en kartetiese grafieke.

Jy kan dit as volg aanwend:

- **Kolomgrafiek om inligting aan te toon wat onafhanklik van mekaar is.** Byvoorbeeld kan inligting weergegee word oor watter voorkeur mense het vir watter soort wegneemetes bv. Chinese kos, KFC of vis en chips.
- **Sirkelgrafieke** toon aan hoe 'n geheel verdeel word in verskillende voorkeure/gegwens. Jy wil byvoorbeeld sien hoe jou begroting gespandeer word op verskillende items gedurende die jaar.
- **Lyngrafieke** toon aan hoe gegewens verander oor tyd. Dit word gebruik om data weer te gee wat verwant is en om tendense oor tyd te toon, bv. die gemiddelde reënval oor 'n tydperk of die gemiddelde nagtemperatuur elke maand van die jaar.
- **Kartesiese grafieke** het nommers op beide asse. So kan jy aandui hoe 'n verandering in een ding 'n ander ding affekteer. Hierdie word veral in wiskunde gebruik en veral in **Algebra**.

Asse

Grafieke het twee asse. Die onderste horisontale lyn word die **x-as** genoem en die vertikale as aan die kant die **y-as**.

- Die onafhanklike veranderlike word op die **x-as** aangedui. Dit is die veranderlike wat jy verander of bepaal tydens jou ondersoek. Jy lees die waardes van links aan die onderkant van die grafiek.
- Die afhanklike veranderlike word op die **y-axis** aangedui, vanaf die onderkant, links van die grafiek.

Vir meer info raadpleeg: <http://www.skillsyouneed.com/num/graphs-charts.html#ixzz4UD66uW5m>

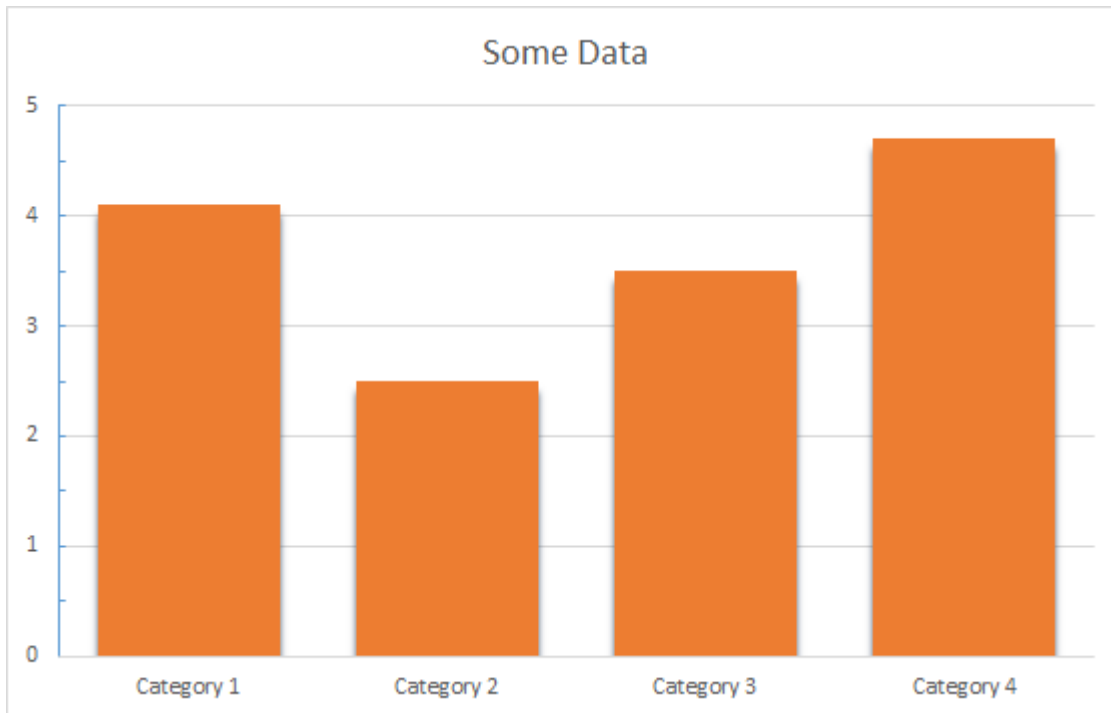
Kolomgrafieke en Histogramme

Kolomgrafieke dui gewoonlik kategorieë op sie x-as en nommers/hoeveelhede op die y-as aan. Die kategorieë moet onafhanklik van mekaar wees, m.a.w. veranderinge in die een moet nie die ander beïnvloed nie.

Bv. Die tabel toon 'n opsomming van data,

Data	
Kategorie 1	4.1
Kategorie 2	2.5
Kategorie 3	3.5
Kategorie 4	4.7

Die data voorgestel in 'n kolomgrafiek



As jy meer wil weet besoek: <http://www.skillsyouneed.com/num/graphs-charts.html#ixzz4UD6H1trU>

Die grafiek dui met een opslag watter hoeveelheid die grootste of die kleinste is.

Jy kan informasie weergee sonder om terug te verwys na die tabel.

Die kolomme kan horisontaal of vertikaal aangedui word maar mag glad **nie aan mekaar raak nie**.

'n Histogram is 'n spesifieke kolomgrafiek waar die ketegorieë spesifieke reeks getalle. 'n Histogram toon gekombineerde aaneenlopende data.

Besoek: <http://www.skillsyouneed.com/num/graphs-charts.html#ixzz4UD6M91xu> vir meer inligting

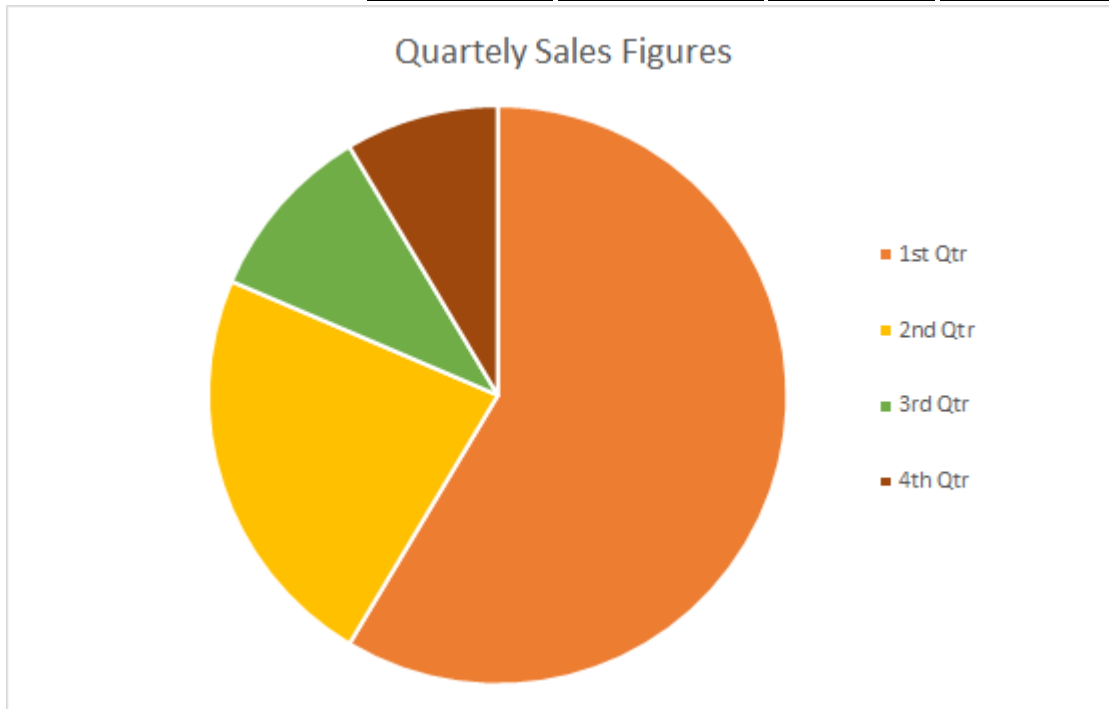
Sirkeldiagram

'n Sirkeldiagram (pie chart) lyk soos 'n sirkel wat in segmente/dele opgebreek is.

In die voorbeeld is die verkope van die jaar opgebreek om die verkope in elke kwartaal aan te dui.

Kwartaalike verkope

1 ^{ste} Kwartaal	2 ^{de} Kwartaal	3 ^e Kwartaal	4 ^{de} Kwartaal
8.2	3.2	1.4	1.2



Die sirkelgrafiek toon duidelik dat die verkope in die eerste kwartaal meer as 50% van die jaarlikse verkope was.

Kwartaal 2 het die tweede meeste verkope gehad, omtrent 'n kwart van die totale verkope.

Sonder om enige iets van die besigheid te weet kan jy bekommerd wees oor die afname in verkope deur die jaar.

Sirkelgrafieke toon afhanklike data.

Sirkelgrafieke toon persentasie van die geheel. Jou total is 100% . Die gegewens wat jy wil aandui word as 'n persentasie van die total uitgewerk e as 'n segment aangetoon..

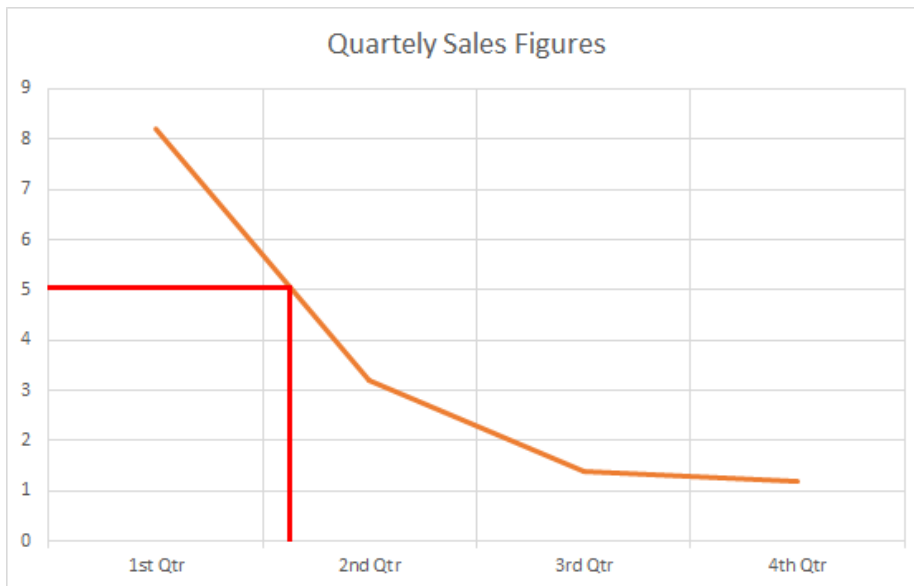
Dit is nie raadsaam om 'n sirkelgrafiek te gebruik as daar meer as 5 of 6 verskillende kategorieë is nie. Te veel segmente is onduidelik en moeilik waarneembaar en 'n ander tipe grafiek moet liewers gebruik word.

Besoek gerus: <http://www.skillsyouneed.com/num/graphs-charts.html#ixzz4UD6gKZRR>

Lyngrafiek

Lyngrafieke word gebruik om **afhanklike data** aan te dui, gewoonlik hoe die data verander oor tyd.

Punte word op die grafiek geplot en dan verbind met 'n lyn. Die data van die sirkelgrafiek sal soos volg lyk as dit as 'n lyngrafiek voorgestel word.



Die grafiek toon ook duidelik hoe die verkope geval het deur die jaar. Dit is duidelik dat die verkope baie vining geval het in die begin van die jaar end an in die 4e kwartaal gestabiliseer het.

In die voorbeeld kan gegewens van die grafiek afgelees word. Ons kan bepaal wanneer die verkope onde 5 eenhede geval 'n lyn van die y-as na die x-as te trek (of visa versa). Ons ka dan sien dit was in die 2e kwartaal.

Besoek: <http://www.skillsyouneed.com/num/graphs-charts.html#ixzz4UD6qb3py>

Onthou:

- 'n Grafiek is 'n prentjie van die resultate van jou eksperiment / ondersoek / navorsing.
- Om die grafiek te verstaan moet die grafiek 'n duidelike opskrif hê wat presies aandui wat die grafiek voorstel. Die afhanklike en onafhanklike veranderlike moet gebruik word.
- Beide asse moet altyd benoem word. Die veranderlike moet aangedui word met die eenheid in hakkies. Bv snelheid ($m \cdot s^{-1}$) of krag (N)
- Die onafhanklike veranderlike word op die x-as aangedui en die afhanklike veranderlike op die y-as.
- Waardes op beide asse moet in veelvoude van dieselfde getal wees bv. 10, 20, 30, 40 ... Dit is nie noodwendig dieselfde waardes as in die tabel nie.

Aktiwiteit 1:

1. Gebruik die data in tabel 1 en teken 'n lyngrafiek.

Tabel 1: Die verandering in die stroomsterkte soos wat die potensiaalverskil in die stroombaam verander het.

	Potensiaalverskil (V)	Stroomsterkte (A)
1	1.5	1
2	3	2
3	4.5	3
4	5	4
5	6.5	5
6	8	6

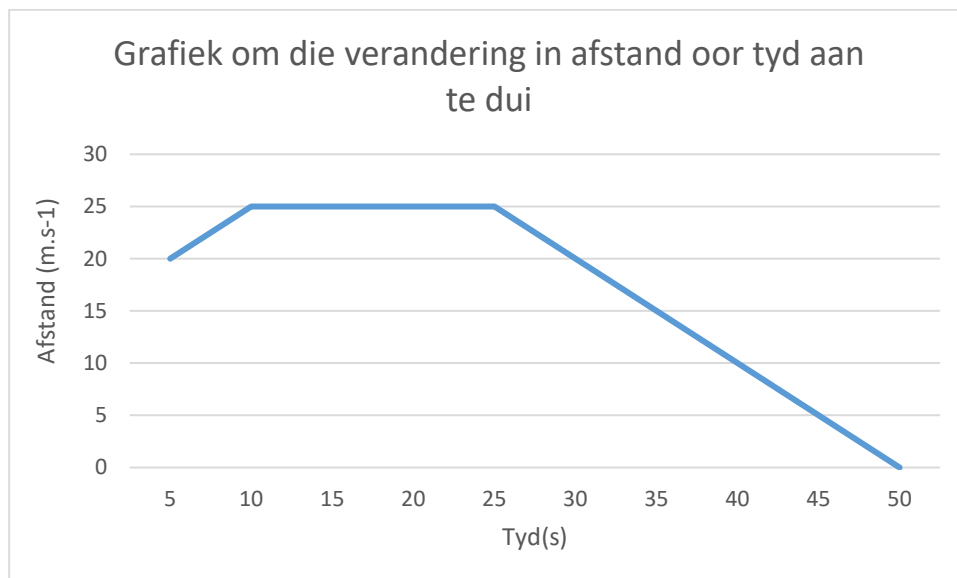
Die eenheid word in die tabel in hakkies aangedui saam met die veranderlike. Ons skryf nie die eenheid saam met elke waarde nie.

2. Wat is die afhanklike veranderlike in die eksperiment?
3. Wat is die onafhanklike veranderlike in die eksperiment?
4. Gee 'n gevolgtrekking wat jy uit die gegewens kan aflei.
5. Bereken die gradiënt van die grafiek.
6. Wat is die eenheid van die gradiënt? WENK: $R = \frac{V}{I}$
7. Wat word voorgestel deur die gradiënt?



Aktiwiteit 2:

Bestudeer die volgende snelheid-tyd grafiek



$$\begin{aligned} \text{Gradiënt} &= \frac{\Delta y}{\Delta x} \\ &= \frac{y_2 - y_1}{x_2 - x_1} \end{aligned}$$

Gebruik 0 as verwysingspunt en beantwoord die vrae wat volg:

8. Wat is die y-afsnit?
9. Wat word deur die y-afsnit aangedui?
10. Wat kan jy aflei rakende die beweging tussen:
 - a. 10s en 25s?
 - b. 0 en 25s?
 - c. 25s en 50s?
11. Wanneer het die voorwerp die vinnigste beweeg?
12. Bereken die gradiënt vir die eerste 10 sekondes van die beweging.
13. Wat is die eenheid van die gradiënt?
14. Wat word voorgestel deur die gradiënt van 'n afstand-tyd grafiek?