

If you wish to illustrate some information using a pie chart you need first of all to be assured that the information you have represents the *total* information that is available. A pie chart is no use, for instance, in illustrating the annual sales figures for years 1990-1997. It can only be used where we have a number of parts making up a whole, and is most useful when the relative proportions are more important than the actual values.

In fact, you need the same type of information as you need to draw a component bar chart.

Example 8

It could be dangerous to illustrate this information with a pie chart:

Make of Car	Ford	Vauxhall	Nissan	Peugeot
Number Sold	15	23	10	18

We must be assured that those four makes of cars represent the totality of the sales. If we are not certain of that, we can only draw a bar chart, because we can always add on extra bars at the end without affecting any of the existing ones.

But a table of data like this:

Make of Car	Ford	Vauxhall	Nissan	Peugeot	Others
Number Sold	15	23	10	18	25

is a better proposition for a pie chart, because we are sure, by inclusion of the column marked 'others', that there are no more cars to be considered.

The first step is to find the total number of cars, i.e. add up 15, 23, 10, 18 and 25 to get 91.

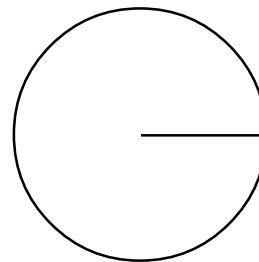
Now, this 91 cars has to represent the 360° of a full circle, and Ford's 15 cars will thus represent $15/91$ of the 360° . So we can calculate this and all the other angles as follows:

Make of Car	No. Sold	Fraction	Angle (°)	(Rounded)
Ford	15	$\frac{15}{91} \times 360^\circ$	59.34 ...	59°
Vauxhall	23	$\frac{23}{91} \times 360^\circ$	90.98 ...	91°
Nissan	10	$\frac{10}{91} \times 360^\circ$	39.56 ...	40°
Peugeot	18	$\frac{18}{91} \times 360^\circ$	71.20 ...	71°
Others	25	$\frac{25}{91} \times 360^\circ$	98.90 ...	99°

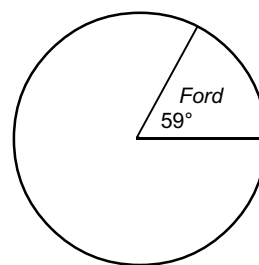
You should check that the rounded off angles add up to 360. If they add to 359 or 361, that's OK, the reason being unfortunate rounding. If they add to anything else, check your arithmetic!

Now to draw the pie chart.

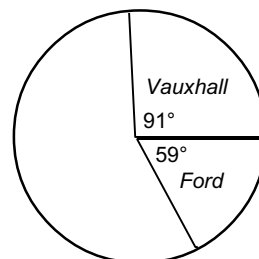
Step 1: Draw a circle with a pair of compasses, mark the centre position (the pin hole) with a dot, draw a radius, i.e. a straight line from this dot to the circle.



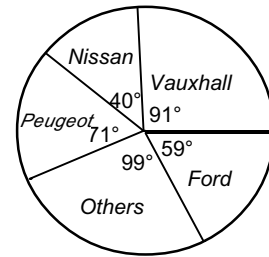
Step 2: Place your protractor with the vertex (or centre of the base line) on the dot and the 0° line along the radius, measure up 59°, mark it off, draw a radius from the centre to the perimeter in line with your mark. Write Ford in the sector you have just completed.



Step 3: Turn your drawing a bit to make life comfortable, place your protractor again with the vertex on the centre, but with the 0° line along the latest radius you have drawn, measure up 91°, mark it off, draw another radius from the centre in line with your latest mark. Write Vauxhall in the sector you have just completed.



Now repeat Steps 2 and 3 until all the sectors have been drawn. You won't have to draw the last Others sector, it will just appear, and hopefully with a 99° angle too.

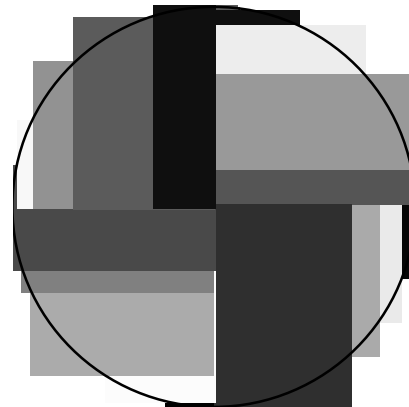


Incidentally, you should be able to draw your angles to an accuracy of $\pm 1^\circ$, so take care.

It is notoriously difficult to give instructions for practical activities, such as using a protractor, using the written word. If you have not followed the above instructions, please do not hesitate to ask your tutor. It is much easier to do this task after you have been physically shown how to do it, than after just reading about it.

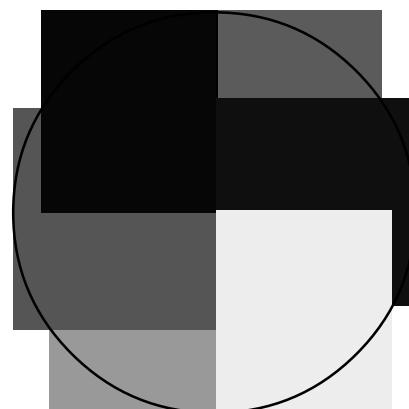
A pie chart is at its most effective when it has no more than half a dozen sectors or so.

If it has umpteen sectors it becomes difficult to tell one from another, and you should either draw a bar chart, or perhaps think of combining some of the sectors to cut down on the confusion, or to draw several charts, each illustrating a more limited amount of information.



After all, the whole point of any chart is to illustrate the information, not just accurately and without attempting to mislead, but also clearly.

If the sectors are too close together in size then it is difficult to put them into any sort of order, as in this illustration here.



A bar chart would really be better, as the eye can distinguish small differences in height of bars better than small differences in rotation of angles.



Illustrate each of the following tables of data by drawing a pie chart.

1. This table shows the breakdown of employees in a manufacturing company:

Category	Management	Clerical	Production	Sales	Distribution
Number	34	52	145	15	15

2. This table shows the sales in April 1998 of the various divisions of a company:

Division	Foods	Detergents	Cosmetics	Paper	Plastics
Sales (£m)	55.3	22.9	21.6	18.5	47.3