

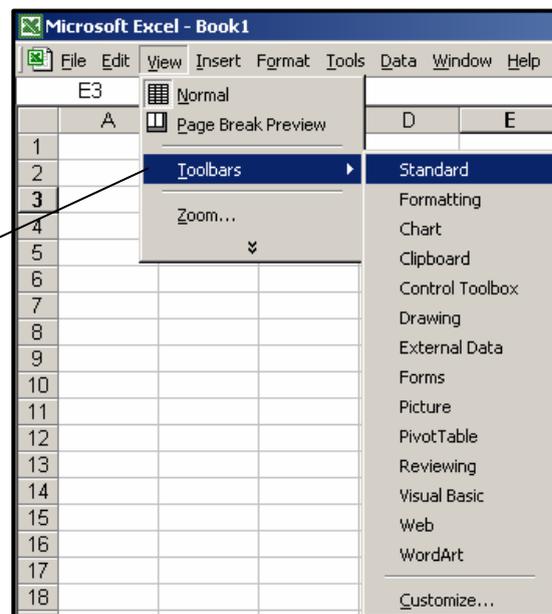
Draw line graphs in Excel

This activity shows how to use a spreadsheet to draw line graphs.

- Open a new **Excel** workbook and look for the **Standard Toolbar**.



- If it is not there, left click on **View** then **Toolbars**, then **Standard** to make it appear.



- Now look for the **Chart Toolbar**.



- If it is not there, left click on **View** then **Toolbars**, then **Chart** to make it appear.
- Now **enter data** onto the spreadsheet. Use the data below (monthly sales in a large shoe shop over two years) or your own data if you wish. Here the data is arranged in rows, but you can use columns if you prefer.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Month	J	F	M	A	M	J	J	A	S	O	N	D
2	Y1 Sales (£000s)	48	18	24	25	29	36	35	27	21	23	28	35
3	Y2 Sales (£000s)	49	25	21	20	19	34	40	36	25	21	33	42

- Left click on **File**, **Save As** and **save your spreadsheet** using an appropriate name. Throughout the activity try to remember to **save your file regularly** so that if anything goes wrong you do not lose all your work.



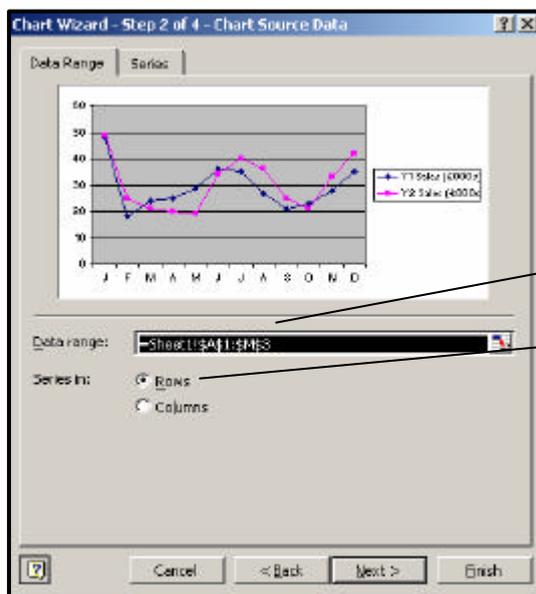
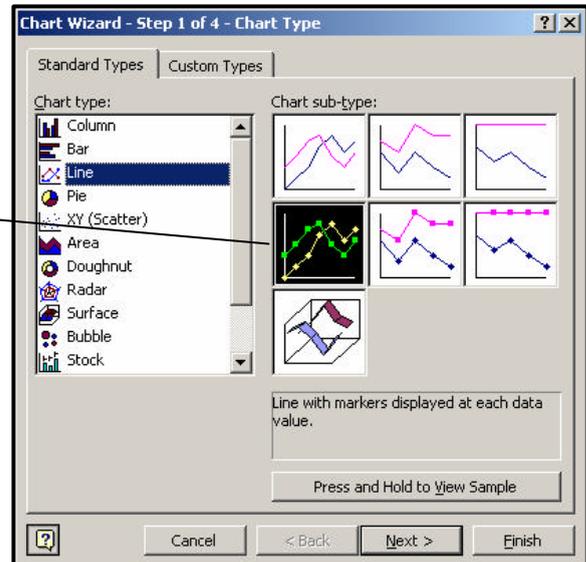
If the categories (i.e. x axis labels) are letters/words draw a Line graph as follows:
 (Note that if you need **numerical** values on the horizontal axis, **a scatter graph gives better results** – see pages 7 – 10.)

- Highlight **all** the data, then left click on the **Chart Wizard**, then **Line** to select the chart type.



In this case the first option in the 2nd row has been selected – this will include a marker to show each data value.

- To continue, left click **Next**.



The menu for Step 2 is shown here. It shows the cell references for the **Data range** and that the data was in rows rather than columns.

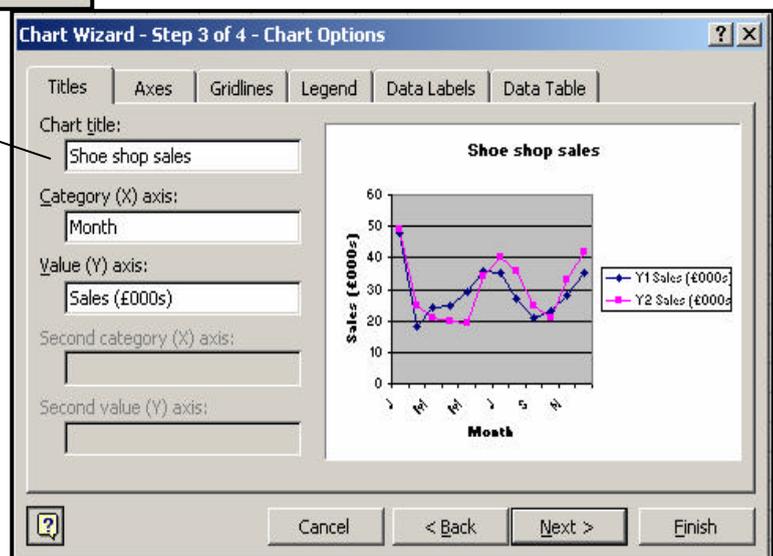
If you highlighted the data correctly in Step 1, you will not need to alter anything here.

- To continue, left click **Next**.

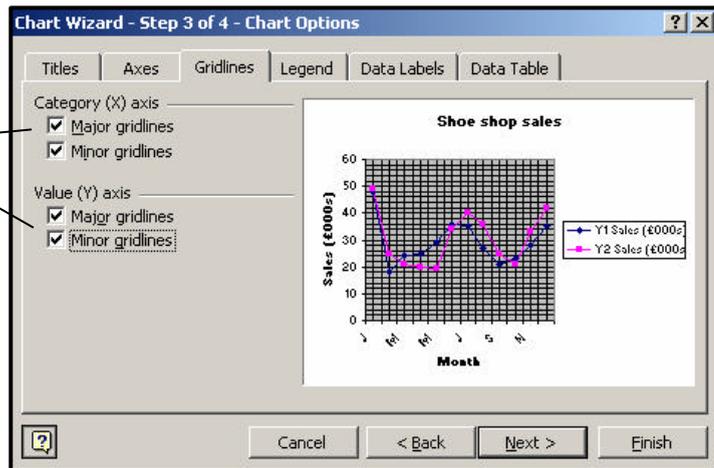
- In Step 3 enter the **title** and **labels** that you want on your graph.

(If you left click on **Legend** you can also change the position of the key if you wish.)

- Left click on **Gridlines** (adding more gridlines will allow you to read values more accurately from the graph when it is finished).

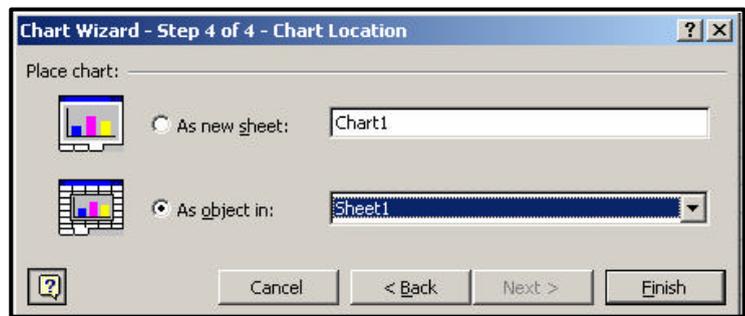


- Left click on the **gridline** boxes until all are ticked as shown.
- Then left click on **Next**.



The last menu allows you to decide whether you want your chart on the same sheet as your data or on a new sheet.

- Choose to have the graph as an object on the same sheet as the data (as shown here).
- Then left click **Finish**.

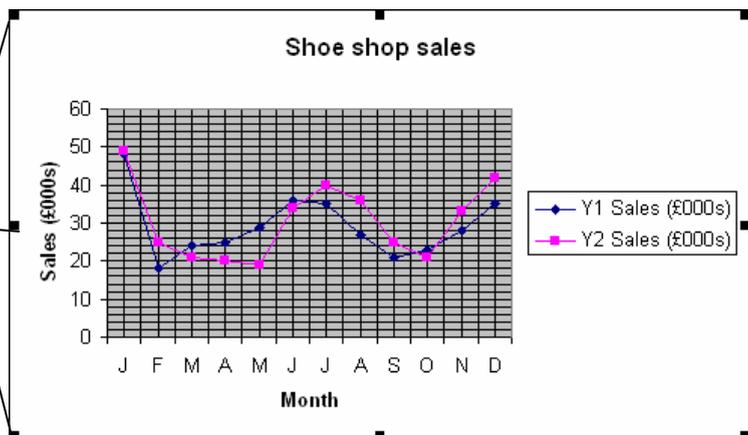


The line graph should appear next to your data.

- **Save** the spreadsheet again (*remember to do this regularly*).

The graph may not be where you want it on the worksheet or you may want to change its shape or size.

- **To move the graph** left click on it and *at the same time* drag the mouse.
- **To change the shape or size** left click on the **handles** and *at the same time* drag the mouse.



The following pages describe some other things you can do.

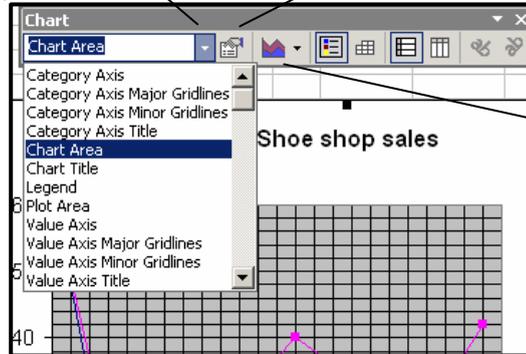
- **Experiment** with these. You can undo anything you don't like by left clicking the **Undo** button.



Using the Chart Toolbar to change things

Left click on this arrow to get a list of items you can change.

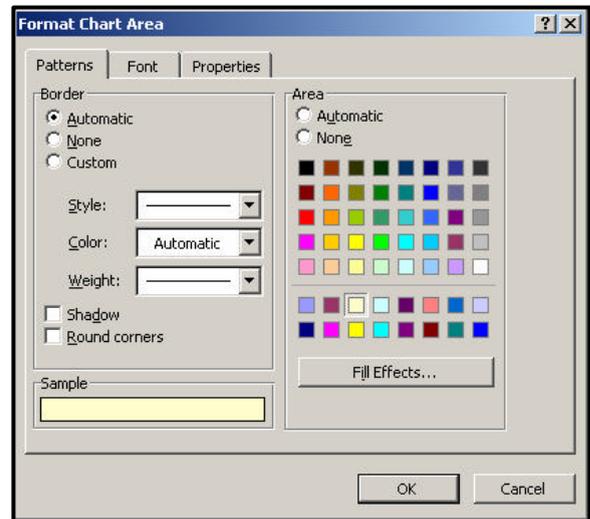
Left click on one of the items in the list then left click on this button to get menus for that item. Experiment with the different options.



Note that this button allows you to change the type of chart (eg you can change the line graph to a bar chart).

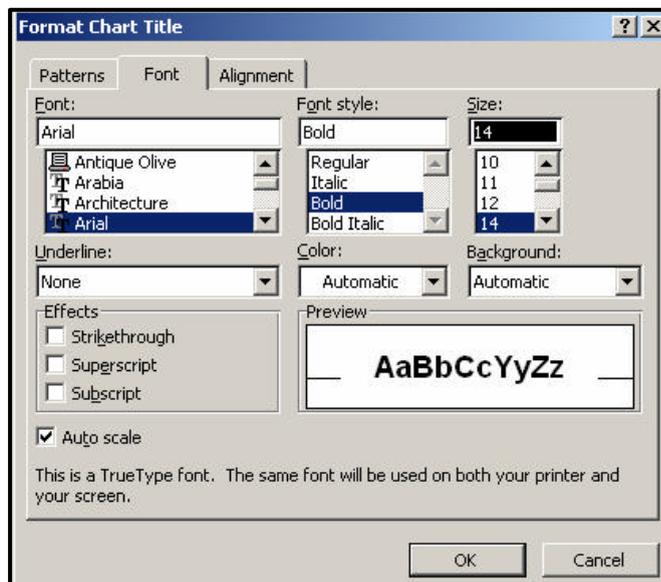
The **Patterns** menu of **Chart Area** allows you to change the colour, style and weight of the border around the chart as well as the colour of the chart itself.

The **Font** menu allows you to change the style and size of all the text on the chart. If you just want to change the text of part of the chart, rather than all of it, then choose that item from the menu on the Chart Toolbar or use one of the methods below.



Alternative ways of getting menus

A **right click** on a particular part of the chart also gives menus and options. For example, right clicking on the chart title gives:



Selecting **Format Chart Title** then gives this menu for changing the font style and size.

Note the **quickest way** to get this menu is to **double left click** on the chart title.



Changing the scale of the graph

Double left clicking on an item is the quickest way to select a feature of the graph, but occasionally it is difficult to click on what you want.

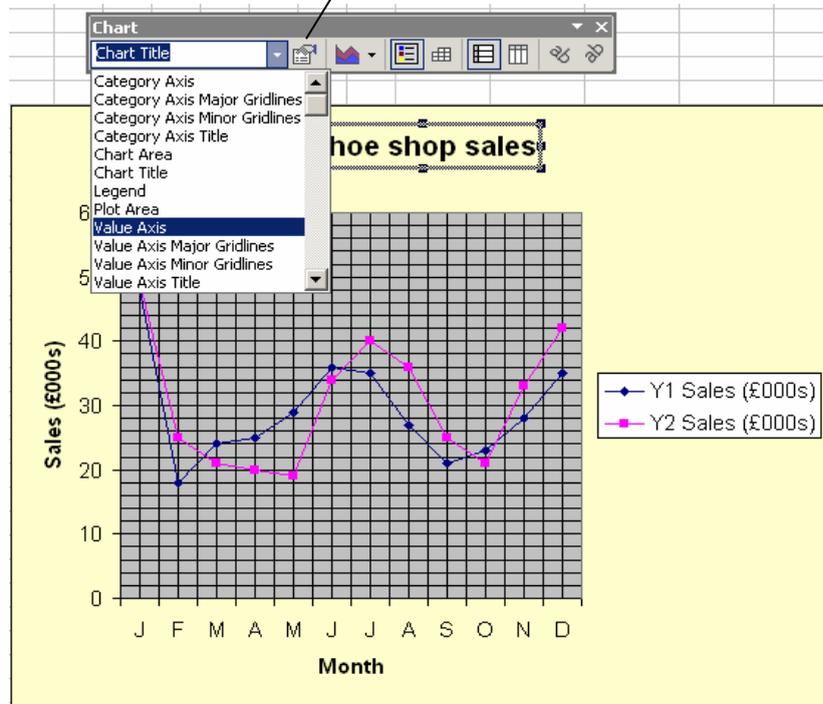
Remember that you can also use the list on the Chart Toolbar as shown here.

Left click **Value axis**, then this button to get menus for the vertical axis.

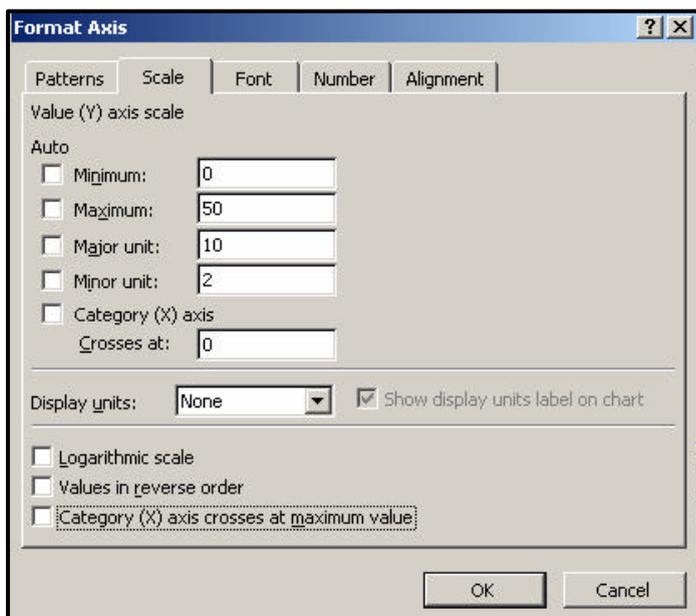
Note:

Category Axis
= horizontal axis

Value Axis
= vertical axis



The **Patterns, Font, Number** and **Alignment** menus allow you to change the appearance of the axis and its markers. Experiment with these if you wish.



- In the **Scale** menu, you can change the **minimum** and **maximum** values on the axis.
- The **Major unit** sets the interval between the major gridlines i.e. between the numbers on the axis.
- The **Minor unit** sets the interval between the minor gridlines.
- When you have entered the values you want, make sure all the **Auto** boxes are not ticked (otherwise Excel may change the values if you resize the graph later).
- **Left click** OK to see the results on the graph.

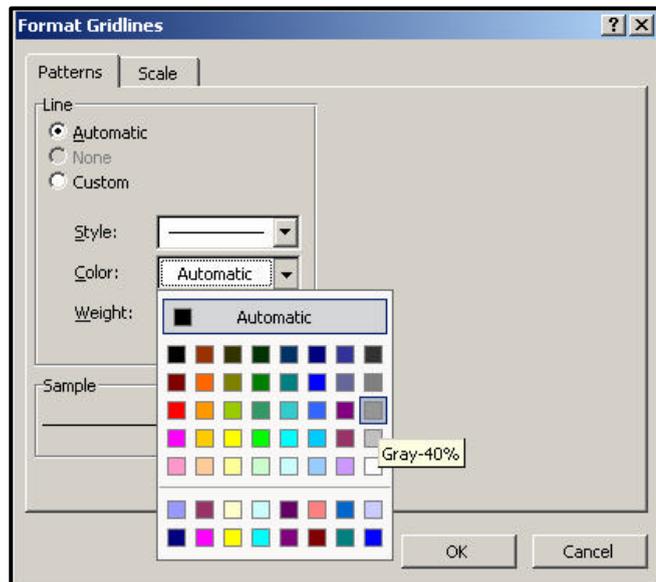


Changing the style of lines

There are various reasons why you may want to change the styles of lines. For example, using black major gridlines and grey minor gridlines makes it easier to read values from a graph.

To change the style of gridlines:

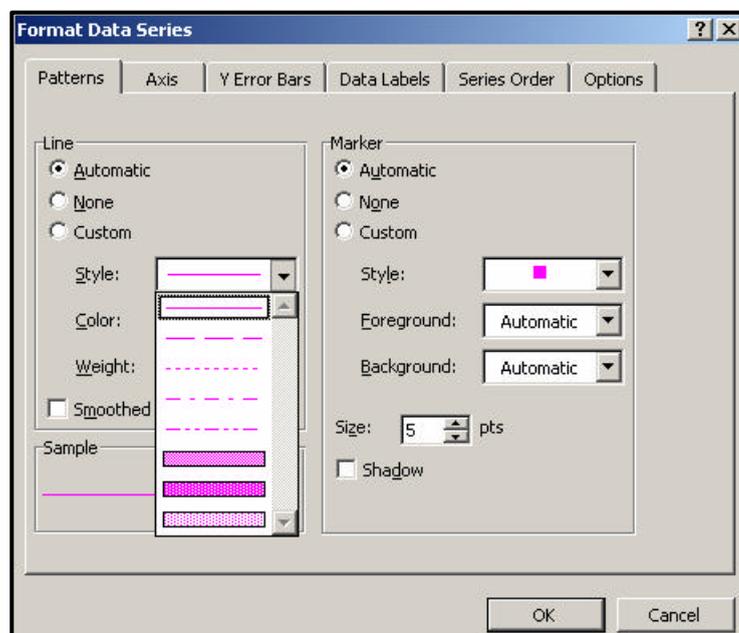
- Double left click on the gridlines you want to change (or choose them in the list on the Chart toolbar).
- In the **Patterns** menu choose the colour that you want. You can also change the style and weight if you wish.



You may also want to change the style, colour or weight of one of the line graphs. For example, if you have not got a colour printer you may need to make one of the line graphs dotted so that you can tell which is which on a black and white print-out.

To change the style of a line graph:

- Double left click on the line (or choose the Series for the line on the Chart toolbar).
- In the **Patterns** menu choose the style, colour and weight that you want. You can also change the style and colour of the markers if you wish.



- **Experiment** with these and other options to find out about the wide variety of effects you can produce on your graph.



If the values for the horizontal axis are numerical, rather than names, then it is better to use the scatter graph option in Excel, rather than the line graph.

An example follows. Use your own data instead if you wish.

The table shows how male and female life expectancy at birth has changed since 1911.

The data is arranged in columns, but you can use rows if you wish.

	A	B	C
1		Life expectancy at birth	
2	Year	Male	Female
3	1911	50.4	53.9
4	1931	58.0	62.0
5	1951	66.1	70.9
6	1971	68.8	75.0
7	1991	73.2	78.8
8	2011	77.4	81.6

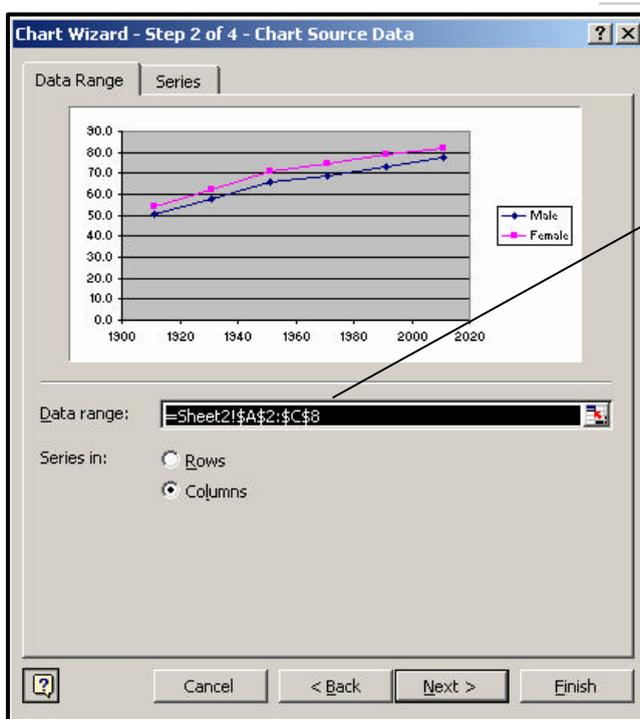
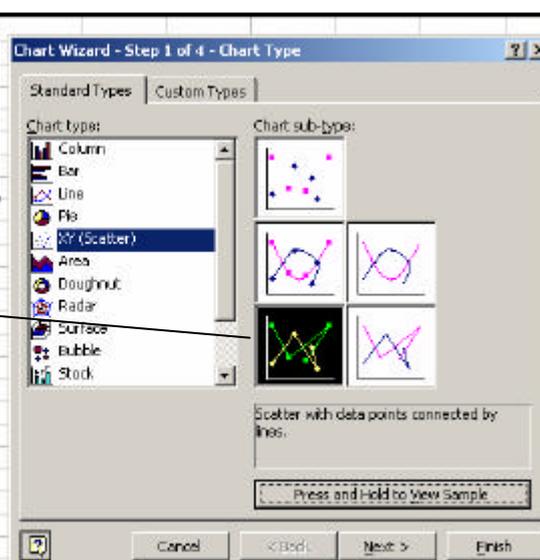
- **Highlight the data** in rows 2 to 8 then left click on the **Chart Wizard**, and **XY(Scatter)** to select the chart type.



	A	B	C
1		Life expectancy at birth	
2	Year	Male	Female
3	1911	50.4	53.9
4	1931	58.0	62.0
5	1951	66.1	70.9
6	1971	68.8	75.0
7	1991	73.2	78.8
8	2011	77.4	81.6

In this case the first option in the 3rd row has been selected – this will include a marker to show each data value.

- To continue, left click **Next**.



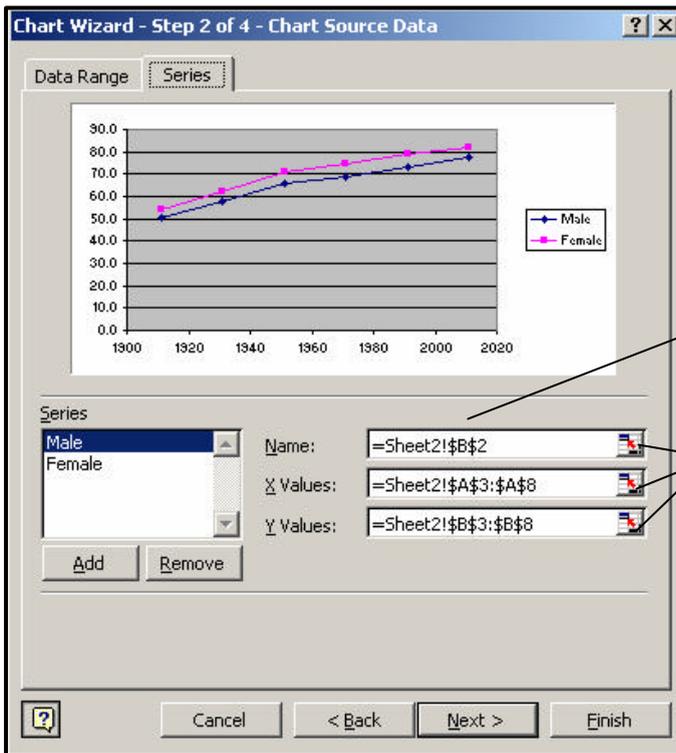
The menu for Step 2 is shown here. It shows the cell references for the **Data range** and that the data was in columns rather than rows.

If you highlighted the data correctly in Step 1, and your graph looks like this you do not need to alter anything here.

- To continue, left click **Next**.

Note that if your data selection was not correct, then the **Series** menu (shown on the next page) allows you to change it.





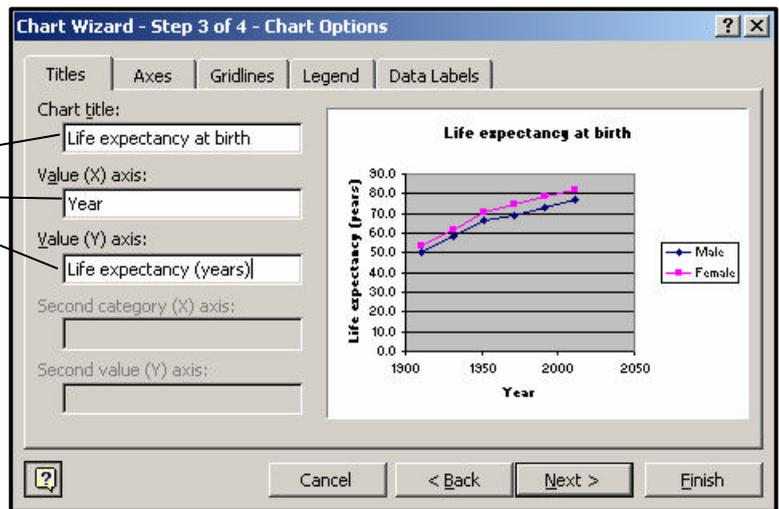
If you need to change your data selection you can type in the series names and cell references here

OR

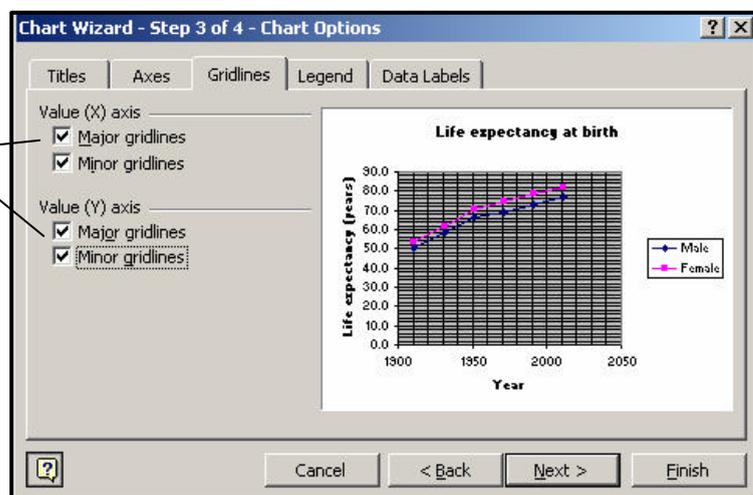
left click on these buttons to select them from the table on the spreadsheet.

- To continue, left click **Next**.

- In Step 3 enter the **title** and **labels** that you want on your graph.
- Left click on **Gridlines** to add more gridlines.

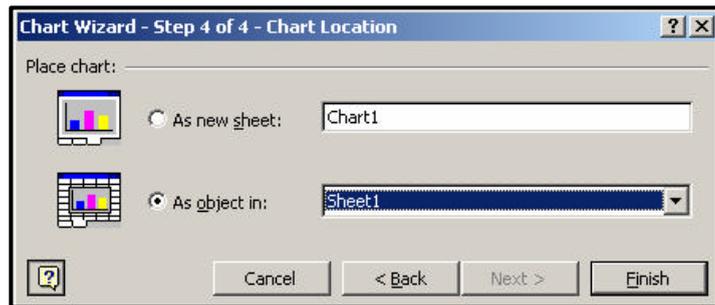


- Left click on the **gridline** boxes until all are ticked as shown.
- Left click on **Next**.

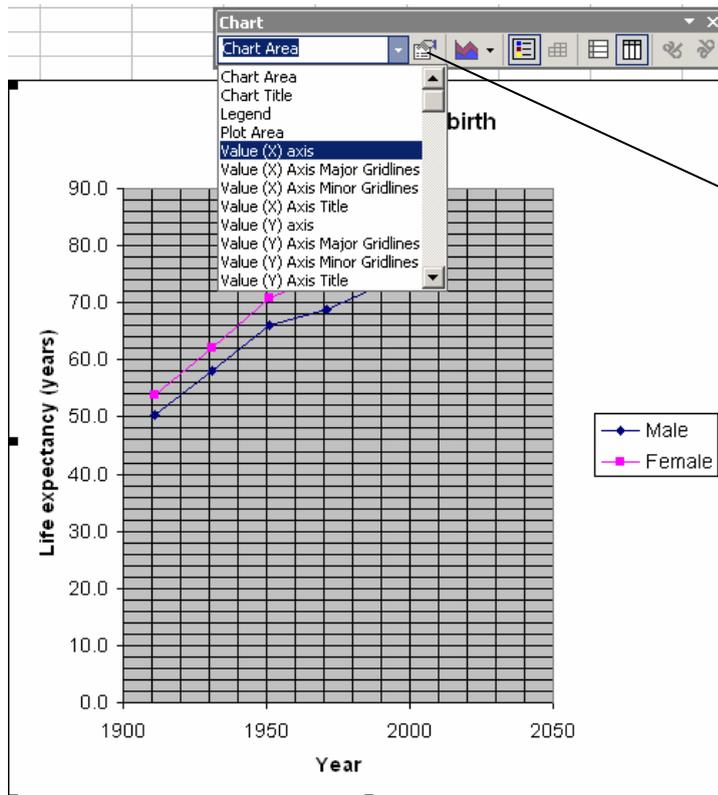


The last menu allows you to decide whether you want your chart on the same sheet as your data or on a new sheet.

- Choose to have the graph as an object on the same sheet as the data (as shown here).
- Then left click **Finish**.



The line graph should appear next to your data. Change the shape and size of the graph if you wish.

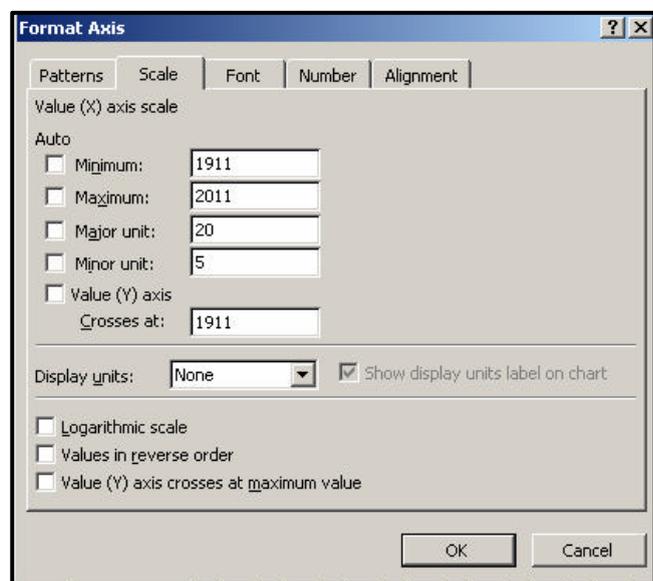


- On the Chart Toolbar list select **Value (X) axis**, then left click this button to get the menu for the horizontal axis.

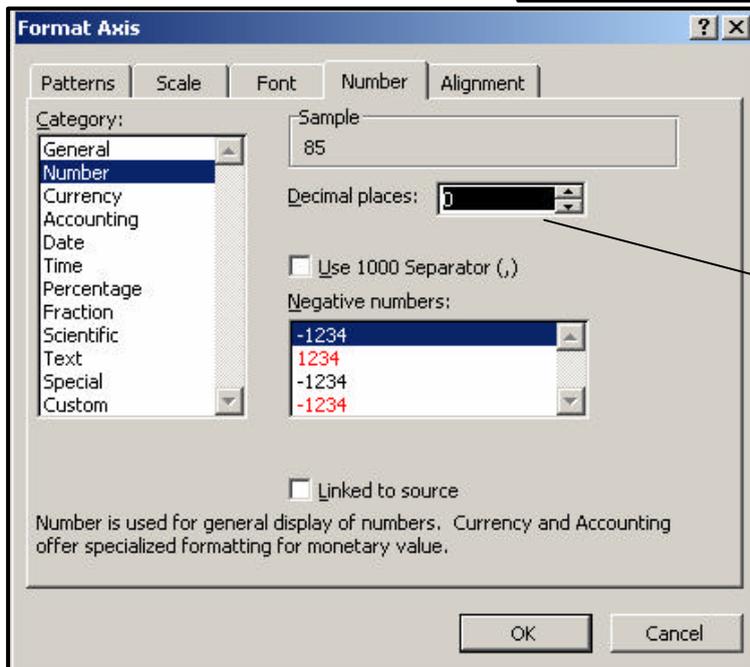
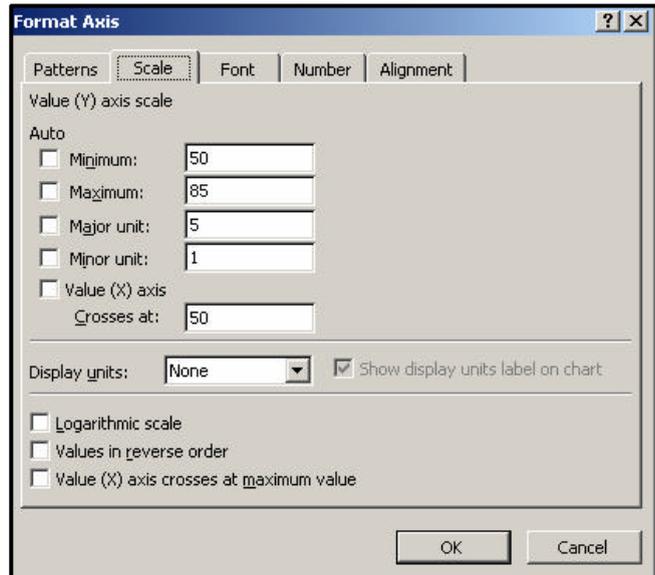
- In the **Scale** menu enter the values given here then click OK.

Remember the Auto boxes should not be ticked (so that Excel cannot alter these values later.)

- Left click **OK**.



- Double left click on the vertical axis or select **Value (Y) axis** in the list on the Chart Toolbar.
- In the **Scale** menu enter the values given here.
- Then click on **Number**.

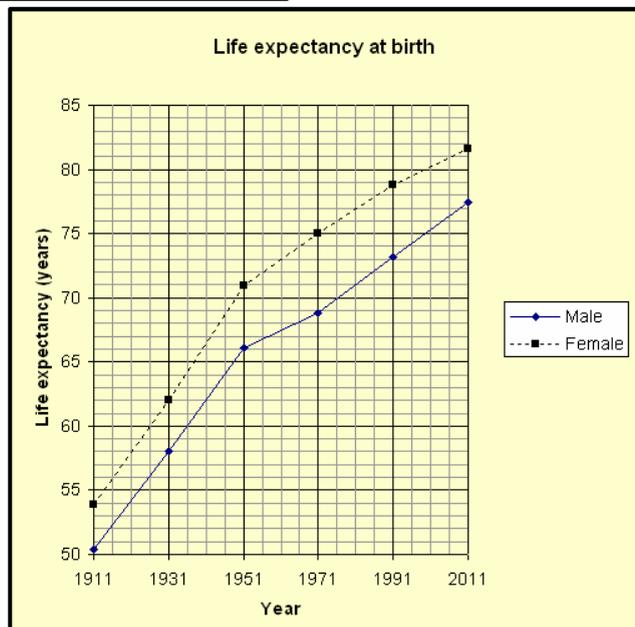


- Left click on **Number** then *reduce the number of decimal places to 0*. This will neaten the values on the y axis to whole numbers.
- Left click **OK** to see the results on the graph.

Change other features of the graph if you wish

One possible version of the graph is shown here.

- **Experiment** with different colours and styles.
- **Draw other line graphs.**



Teacher Notes

Units Foundation Level, Making sense of data
Intermediate Level, Handling and interpreting data
Advanced Level, Using and applying statistics.

Skills used in this activity:

- drawing line graphs in Excel

Preparation

Students will need to have some basic knowledge of computer terminology and the use of computers (eg how to use the mouse and menus in Excel).

Notes

The scatter graph option in Excel often gives a better result than the line graph option.

