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.

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• If it is not there, left click on View then Toolbars , then Standard to make it appear.	Microsoft Excel - Book1 Image: Second seco
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.

	А	В	С	D	Е	F	G	Н	I	J	Κ	L	М
1	Month	J	F	М	Α	М	J	J	Α	S	0	Ν	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.)



hart Wizard - Step 3 of 4 - Chart Options ? X Left click on the . Gridlines Legend Data Labels Data Table Titles Axes gridline boxes until all Category (X) axis Shoe shop sales Major gridlines are ticked as shown. Minor gridlines Value (Y) axis (£0003) Then left click on Major gridlines ← Y1 Sales (£000s) Minor gridlines Next. Y2 Sales (£000s ales 2 Cancel < <u>B</u>ack Next > Einish

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**.

Chart Wizard	- Step 4 of 4 - Char	t Location ? ×
Place chart: -		
	C As new sheet:	Chart1
	• As object in:	Sheet1
2	Cancel	< Back Next > Einish

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 • Shoe shop sales on it and *at the same time* drag the mouse. 60 50 To change the shape or • Sales (£000s 40 size left click on the handles – Y1 Sales (£000s) 30 Y2 Sales (£000s) and *at the same time* drag 20 the mouse. 10 0 MAM JJ A S 0 n J F M. Month 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.



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Using the Chart Toolbar to change things



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.

ormat Cha	rt Area			? ×
Patterns Border © Autom Custor Style: Color: Weigh Shado Round	Font atic n Au t:	Properties	Area Automatic Nong Fill Effects	
			ОК Са	ancel

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:

	52 b /	
Patterns Font Align	ment	
Eont:	Font style:	Size:
Arial	Bold	14
Antique Olive	A Regular	▲ 10 ▲
🖫 Arabia	Italic	11 🗖
The Architecture	Bold Thelia	12
Anar		
Underline:		Background:
None	 Automatic 	 Automatic
Effects	Preview	
Strikethrough		
	AaB	bCcYvZz
□ Subscript		
- odžacube		
Auto scale		
This is a True type font. The	same font will be used	on both your printer and
your screen.		
		100 La
		OK Cancel

Shoe shop sales								
<u>ě</u>	* 😭	F <u>o</u> rmat Chart Title						
		Cle <u>a</u> r						
	ÌF							

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.



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.

Patterns So Value (Y) axis so Auto Mi <u>n</u> imum:	ale Font	Number	Alignment	
Maximum:	0 50 10			
Category (<u>C</u> rosses a Display <u>u</u> nits:	X) axis :: 0 None		ow display unit	s label on chart
Logarithmic s	cale erse order axis crosses at r	<u>n</u> aximum valu	e)	

- 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.

<u>A</u> utomatic			
C None			
C Custom			
<u>S</u> tyle: -	<u> </u>		
<u>⊂</u> olor: 7	utomatic 👻		
Weight:	Automatic		
Sample 📃			
	G	ray-40%	

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.

atterns Axis	Y Error Bars	Data Labels Series Order Options
Line		Marker
Automatic		• Automatic
C None		C None
C Custom		C Custom
<u>S</u> tyle:		Style:
	<u> </u>	Eoreground: Automatic 💌
Weight:		Background: Automatic 💌
Smoothed		
Sample	P	Size: 15 🛨 pts
		Shadow

• **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.

Year

1911

1931

1951

1971

1991

2011

8 9 10

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.

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

	А	В	С
1		Life expecta	ncy 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 3^{rd} row has been selected – this will include a marker to show each data value.

• To continue, left click **Next.**

Data Range	Series	
30.0 80.0 70.0 60.0 50.0 40.0		- Male - Female
20.0	1920 1940 1960 1980 2000 202	•
<u>D</u> ata range: Series in:	Sheet21\$A\$2*\$C\$8	N

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.



Chart Wizard - Step 2 of 4 - Chart Source Data Data Range Series	? × Male Emale 2020 \$2 \$2 \$3:\$A\$8 \$3:\$B\$8	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.
Cancel < Back Ne	xt > Einish Chart Wizard - Step 3 of 4 Titles Axes Grid	4 - Chart Options
 In Step 3 enter the title and labels that you want on your graph. Left click on Gridlines to add more gridlines. 	Chart gde: Life expectancy at birth Value (X) axis: Year Value (Y) axis: Life expectancy (years Second category (X) axis: Second value (Y) axis: Second value (Y) axis:	ch ife expectancy at bith ife expectancy at bith
 Left click on the gridline boxes until all are ticked as shown. Left click on Next. 	zard - Step 3 of 4 - Chart 0 Axes Gridlines Lega ajor gridlines nor gridlines Y) axis ajor gridlines nor gridlines	pend Data Labels Life expectancy at birth Understand by the second by



Einish

Cancel

< <u>B</u>ack

1

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2

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**.

Chart Wizard - Step 4 of 4 - Chart Location				? ×
Place chart: -				
	C As new <u>sheet</u> :	Chart1		
	• As object in:	Sheet1		•
	Cancel	< <u>B</u> ack	Next >	Einish

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



• 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**.





	Format Axis	
 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. 	Format Axis ? × Patterns Scale Font Number Alignment Value (Y) axis scale Auto Minimum: 50 Image: Solution of the scale Maximum: 85 Major unit: 55 Image: Solution of the scale Minor unit: 1 Value (X) axis Grosses at: 50 50 Image: Show display units label on chart Display units: None Image: Show display units label on chart Image: Logarithmic scale Values in reverse order Value (X) axis crosses at maximum value Value (X) axis crosses at maximum value Image: Show display units label on chart	
	OK Cancel	
Format Axis Patterns Scale Font Number Alignmer General 85 Decimal places: Decimal places:	 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.	Life expectancy at birth	

- **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.