

# Excel 365 Advanced

**Sample manual - first two chapters**



**Wise Owl**  
Training

## TABLE OF CONTENTS (1 of 7)

1	FORMULAE AND FUNCTIONS	Page
1.1	Basic Formulae	9
	<i>Operators</i>	9
	<i>Brackets in Formulae</i>	9
1.2	Creating Formulae	10
1.3	Editing Formulae	11
1.4	Copying Formulae	12
	<i>The Easiest Way to Copy a Formula</i>	12
	<i>Other Ways to Copy a Formula</i>	13
	<i>How Relative Cell Referencing Works</i>	13
1.5	Functions	14
	<i>Basic Functions</i>	14
	<i>Structure of a Function</i>	14
	<i>Typing a Function</i>	15
	<i>Using AutoSum to Create Quick Totals, Averages, Etc.</i>	15
	<i>The Quickest Way to Sum</i>	16
	<i>The Function Wizard</i>	16
1.6	Status Bar Calculations	18

2	MOVING AND SELECTING IN EXCEL	Page
2.1	Moving Around in Excel	19
	<i>Using the Mouse to Move Around</i>	19
	<i>Keyboard Shortcuts for Moving Around</i>	20
	<i>Zooming the View</i>	20
2.2	Selecting Cells	21
	<i>Selecting Single Cells</i>	21
	<i>Selecting a Range of Cells</i>	21
	<i>Selecting a Large Range of Cells</i>	22
	<i>Selecting Multiple Ranges</i>	22
	<i>Selecting Entire Rows and Columns</i>	23
	<i>Selecting an Entire Worksheet</i>	23
	<i>De-Selecting Cells</i>	24
	<i>Using the Keyboard to Select Cells</i>	24

3	ABSOLUTE AND RELATIVE REFERENCES	Page
3.1	Relative Referencing	25
3.2	Absolute References	26
	<i>When Relative Referencing doesn't Work</i>	26
	<i>The Solution – Use Absolute References</i>	26
	<i>Fixing Just the Row or Column</i>	27

4	RANGE NAMES	Page
4.1	What are Range Names?	28
	<i>Going to a Range Name</i>	28
4.2	Creating Range Names	29
	<i>Creating Range Names using the Name Box</i>	29
	<i>Defining Range Names</i>	29
4.3	Creating Formulae using Range Names	30
	<i>Creating Formulae using Range Names (General)</i>	30
	<i>Creating Formulae using Range Names for Single Cells</i>	31
	<i>Editing Range Name Formulae</i>	31
4.4	Spill Formulae	32
	<i>Creating Formula using Range Names for a Group of Cells - SPILL</i>	32
	<i>How Spill Formulae Work</i>	33
	<i>Preventing Excel using SPILL</i>	33
	<i>Implicit Intersection</i>	34
	<i>Opening Old Excel Workbooks using Implicit Intersection</i>	34
	<i>Dealing with #SPILL Errors</i>	35
4.5	Changing Range Names	36
	<i>Editing and Deleting Range Names</i>	36
	<i>Avoiding the Need to Change Range Names</i>	36
4.6	Creating Range Names from Selected Cells	37
4.7	Scope of Range Names	38
	<i>Choosing the Scope of a Range Name</i>	38
	<i>Copying Worksheets Copies their Range Names with Local Scope</i>	38
4.8	Managing Range Names	39
	<i>Listing out Range Names</i>	39
	<i>Applying Range Names</i>	39
4.9	Quirks of Range Names	40
	<i>Getting Aggregation Functions to Work</i>	40
	<i>Viewing Range Names</i>	40
	<i>3-Dimensional Ranges</i>	41

## TABLE OF CONTENTS (2 of 7)

5	IF FUNCTIONS	Page
5.1	Overview of IF Functions	42
	<i>Relational Operators</i>	42
5.2	Creating IF Functions	43
	<i>Typing IF Functions</i>	43
	<i>Using the Function Wizard</i>	44
5.3	Nesting IF Conditions	45
	<i>Step 1 – Define the Conditions</i>	45
	<i>Step 2 – Create the Nested IF Function</i>	45
	<i>An Alternative: the IFS function</i>	46
5.4	The SWITCH Function	47
5.5	Combining IF with Other Logical Functions	48

6	THE VLOOKUP FUNCTION	Page
6.1	Types of Lookup Table	49
	<i>Exact Matches or Not?</i>	49
	<i>Horizontal or Vertical?</i>	49
6.2	Inexact Matches (Continuous Value Lookups)	50
	<i>Creating the Lookup Table</i>	50
	<i>Giving the Lookup Table a Range Name</i>	50
	<i>Creating the VLOOKUP Formula</i>	51
6.3	Exact Match Lookup Tables	52
	<i>Syntax of the Exact VLOOKUP Function</i>	52
	<i>Creating a Range Name for your Lookup Table</i>	53
	<i>Creating the Lookup Formula</i>	53
6.4	Trapping Errors	54
	<i>Method 1 - Preventing Errors Happening with Data Validation</i>	54
	<i>Method 2 - Adding Outliers to your Input Table</i>	55
	<i>Method 3 – Converting Invalid Values using IF</i>	55
	<i>Method 4 – Trap Errors when they Occur</i>	55

7	OTHER LOOKUP FUNCTIONS	Page
7.1	Combining MATCH and INDEX	56
	<i>Reasons to Prefer MATCH/INDEX to VLOOKUP</i>	56
	<i>The Range Names for our Example</i>	57
	<i>The Syntax of MATCH</i>	57
	<i>Using MATCH to Find Row/Column Numbers for our Example</i>	58
	<i>Syntax of the INDEX Function</i>	58
	<i>Creating the INDEX Function for our Example</i>	59
	<i>Combining MATCH and INDEX in a Single Function</i>	59
7.2	The XMATCH Function	60
	<i>The XMATCH Function Arguments</i>	60
7.3	The CHOOSE Function	61
7.4	The OFFSET Function	62
	<i>Basic Offsetting</i>	62
	<i>Setting the Number of Rows/Columns Returned</i>	63
7.5	The INDIRECT Function	64
	<i>Example: Picking Out Figures from a Chosen Worksheet</i>	64

8	THE XLOOKUP FUNCTION	Page
8.1	Introduction to XLOOKUP	65
	<i>Our Example for this Chapter</i>	65
	<i>The XLOOKUP Function Arguments</i>	65
8.2	Using XLOOKUP	65
	<i>Basic Lookups</i>	66
	<i>Reversing the Sort Order</i>	66
	<i>Using Wildcards</i>	67
	<i>Setting a Not Found Value</i>	68
	<i>Returning Arrays</i>	68

9	INSPECTION AND ERROR FUNCTIONS	Page
9.1	Inspection Functions	69
	<i>Non-Error Inspection Functions</i>	69
	<i>Error Inspection Functions</i>	69
9.2	Handling Errors	70
	<i>General Error Trapping using IFERROR</i>	70
	<i>Avoiding the Error in the First Place</i>	70

## TABLE OF CONTENTS (3 of 7)

10	DATA VALIDATION	Page
10.1	What is Data Validation?	71
10.2	Creating Validation Rules	72
	<i>Step 1 – Saying what is Allowed</i>	72
	<i>Step 2 – Defining your Punishment for Mistakes</i>	73
10.3	Referencing Formulae in Validation	74
10.4	Dropdown Lists	75
	<i>Step 1 - Creating a Range Name</i>	75
	<i>Step 2 – Setting the List</i>	75
10.5	Input Messages	76
10.6	Copying and Clearing Validation Settings	77
	<i>Copying Validation</i>	77
	<i>Clearing Validation Settings</i>	77
10.7	Highlighting Validated Cells	78
	<i>Highlighting Cells which have Validation Applied</i>	78
	<i>Circling Invalid Data</i>	78

11	DYNAMIC RANGE NAMES	Page
11.1	Examples of Dynamic Range Names	79
11.2	Making a Range Name Dynamic	80
	<i>The Principle: the OFFSET Function</i>	80
	<i>Creating the Range Name</i>	80
	<i>Using Dynamic Range Names</i>	81
11.3	Dynamic Range Names and Charts	82
	<i>Creating the Range Names</i>	82
	<i>Making the Chart Refer to these Ranges</i>	82

12	INFORMATION FUNCTIONS	Page
12.1	The CELL and INFO Functions	83
	<i>The INFO Function</i>	83
	<i>The CELL Function</i>	83
12.2	Sheet Number / Numbers	84
	<i>The SHEET Function</i>	84
	<i>The SHEETS Function</i>	84

13	TEXT FUNCTIONS	Page
13.1	List of Text Functions	85
	<i>Searching and Replacing Text</i>	85
	<i>Extracting one String from Another</i>	85
	<i>Converting Strings</i>	86
	<i>Other Text Functions</i>	86
	<i>Joining Multiple Items</i>	86
	<i>Converting Numbers and Dates to Text</i>	87
13.2	Text Functions – a Case Study	88

14	MULTIPLE WORKSHEETS	Page
14.1	Moving between Worksheets	89
14.2	Common Tasks	90
	<i>Selecting and De-selecting Worksheets</i>	90
	<i>Renaming Worksheets</i>	90
	<i>Changing Worksheet Tab Colours</i>	91
	<i>Hiding and Unhiding Worksheets</i>	91
14.3	Inserting and Deleting Worksheets	92
	<i>Inserting Single Worksheets</i>	92
	<i>Inserting Multiple Worksheets</i>	92
	<i>Deleting Worksheets</i>	92
14.4	Moving and Copying Worksheets	93
	<i>Moving Worksheets within a Workbook</i>	93
	<i>Copying Worksheets within a Workbook</i>	93
	<i>Moving and Copying to a Different or New Workbook</i>	94
14.5	Group Mode	95
14.6	Summing across Sheets	96

## TABLE OF CONTENTS (4 of 7)

15	TABLES	Page
15.1	Definition of a Table	97
15.2	Creating and Removing Tables	98
	<i>Creating Tables from Existing Data</i>	98
	<i>Creating Tables from Scratch</i>	98
	<i>Removing Tables</i>	99
15.3	Sorting Tables	100
	<i>Simple Sorting – 3 Methods</i>	100
	<i>Sorting by Two or More Columns</i>	101
	<i>Sorting by Colour</i>	102
15.4	Simple Filtering	103
	<i>Step 1 – Enabling Filtering</i>	103
	<i>Step 2 – Filtering by Columns</i>	104
15.5	Removing Filters	105
	<i>Clearing a Filter from a Single Column</i>	105
	<i>Clearing All Filters</i>	105
	<i>Removing Filtering</i>	105
15.6	Filtering Specific Types of Data	106
	<i>Filtering Numbers</i>	106
	<i>Filtering Text</i>	107
	<i>Filtering Dates</i>	107

16	ADVANCED TABLES	Page
16.1	Removing Duplicate Rows	108
16.2	Using the Data Form	109
	<i>Adding the Data Form to the Quick Access Toolbar</i>	109
	<i>Using the Data Form to View Records</i>	110
	<i>Using the Data Form to Add New Records</i>	110
	<i>Using the Data Form to Delete Records</i>	111
	<i>Using the Data Form to Find Records Matching your Criteria</i>	111
16.3	Advanced Filtering (Using OR and AND)	113
	<i>Step 1 – Creating and Setting a Criteria Range</i>	113
	<i>Step 2 – Creating an Extract Range</i>	114
	<i>Step 3 – Applying Advanced Filtering</i>	114
	<i>Examples of Criteria</i>	115
	<i>Multiple Extract Ranges</i>	116
	<i>Extracting to other Sheets</i>	116

17	FORMATTING TABLES	Page
17.1	Formatting Tables	118
	<i>Changing the Scope of Formatting</i>	118
	<i>Applying a Format</i>	119
	<i>When Formatting appears not to Work</i>	119
17.2	Creating Table Styles	120
	<i>Step 1 - Creating the Table Style</i>	120
	<i>Step 2 – Formatting Parts of your Style</i>	121
	<i>Step 3 – Setting the Stripe Size</i>	122

18	SUBTOTALS	Page
18.1	What Subtotals Do	123
18.2	Creating Subtotals	124
	<i>Step 1 – Sorting the Data Correctly</i>	124
	<i>Step 2 – Checking you can Create Subtotals</i>	124
	<i>Step 3 – Creating Subtotals</i>	125
	<i>Step 4 – Grouping and Outlining</i>	125
	<i>Step 5 – Copying the Visible Cells Only</i>	126
18.3	Removing Subtotals	127

19	GROUPING (OUTLINING)	Page
19.1	Using Grouping	128
19.2	Creating Grouping/Outlining	129
	<i>Creating Automatic Outlines</i>	129
	<i>Manually Grouping Rows/Columns</i>	129
19.3	Problems with Grouping/Outlining	130
	<i>Changing Outlining Position</i>	130
	<i>Using Grouping/Outlining with Protection</i>	130
19.4	Removing Outlining/Grouping	131
	<i>Removing Outlining/Grouping from Selected Rows/Columns</i>	131
	<i>Removing All Outlining</i>	131

## TABLE OF CONTENTS (5 of 7)

20	PIVOT TABLES	Page
20.1	Overview	132
20.2	Creating Pivot Tables	133
	<i>Step 1 – Ensure you have a Table</i>	133
	<i>Step 2 – Create your Pivot Table</i>	133
	<i>Step 3 – Configure your Fields</i>	134
20.3	Deleting Pivot Tables	135
20.4	Drilling Down	136
20.5	Working with Pivot Tables	137
	<i>Renaming Fields</i>	137
	<i>Changing how Values are Calculated</i>	137
	<i>Changing Number Formatting</i>	138
	<i>Moving Rows and Columns</i>	139
	<i>Sorting Pivot Tables</i>	139
20.6	Refreshing Pivot Tables	140
	<i>Getting Pivot Tables to Refresh when you Open Workbooks</i>	140
20.7	Working with Dates	141
	<i>Grouping by Date</i>	141
20.8	Filtering and Slicers	142
	<i>Filtering a Pivot Table</i>	143
	<i>Creating Slicers</i>	143
	<i>Removing Slicers (or their Filters)</i>	144
	<i>Changing the Number of Slicer Columns</i>	144
	<i>Changing the Style of a Slicer</i>	144
20.9	Formatting Pivot Tables	145
20.10	Choosing what to Display	146
	<i>Hiding Field Captions</i>	146
	<i>Inserting Blank Rows</i>	146
	<i>Subtotals and Totals</i>	147
	<i>Changing Report Layout</i>	147
	<i>Repeating Item Labels</i>	147
20.11	Creating New Groups in a Pivot Table	148
	<i>Ungrouping</i>	148
20.12	Displaying % of Grand Totals	149
20.13	Report Filter Pages	150

21	GETTING DATA	Page
21.1	A Potted History of Get & Transform	151
21.2	What Get & Transform Does	152
21.3	Getting Data	153
	<i>Step 1 - Creating the Query</i>	153
	<i>Step 2 – Load or Edit?</i>	154
21.4	Managing Queries	155
21.5	Linking to a Website	156
21.6	Linking to an XML File	157
21.7	Other Data Sources	158

22	TRANSFORMING DATA	Page
22.1	Editing a Query	159
	<i>The Query Editor</i>	159
22.2	Editing Query Steps	160
	<i>The Hard Way – the M Language</i>	160
	<i>The Easy Way – Query Steps</i>	160
22.3	Adding Simple Transforms	161
	<i>Removing Columns</i>	161
	<i>Reordering Columns</i>	161
	<i>Filtering Rows</i>	162
	<i>Sorting Columns</i>	162
22.4	Splitting Columns, etc. – a Case Study	163
	<i>Step 1 – Splitting by Number of Characters</i>	163
	<i>Step 2 – Splitting by Delimiter</i>	164
	<i>Step 3 – Replacing Values</i>	165
	<i>Step 4 – Changing Data Types</i>	165
	<i>Step 5 - Merging Columns</i>	166
	<i>Step 6 – Inserting a Start Date Column</i>	166
	<i>Step 7 – Getting the Month Number</i>	167
	<i>Step 8 – Aggregating the Data</i>	167
	<i>Step 9 – Renaming Query Steps</i>	168
	<i>Step 10 – Running your Query</i>	168
22.5	Managing your Queries	169
	<i>Renaming Queries</i>	169
	<i>Grouping Queries</i>	169
22.6	Recent Data Sources	170

## TABLE OF CONTENTS (6 of 7)

23	CHARTS	Page
23.1	Overview	171
23.2	Selecting Data	172
	<i>The Golden Rules for Selecting Chart Data</i>	172
	<i>Selecting a Simple Data Range</i>	172
	<i>Selecting Multiple Ranges</i>	173
	<i>Selecting Non-Contiguous Ranges</i>	173
23.3	Creating Charts	174
23.4	Chart Location	175
	<i>Embedded Charts</i>	175
	<i>Printing Embedded Charts</i>	175
	<i>Separate Sheet Charts</i>	176
	<i>Switching between Embedded and Separate Sheet Charts</i>	176
23.5	Chart Types, Templates and Defaults	177
	<i>Changing a Chart's Type (Including Chart Templates)</i>	177
	<i>Creating Chart Templates</i>	177
	<i>Setting the Default Chart</i>	178
23.6	Formatting Charts	179
23.7	Formatting Parts of a Chart	180
	<i>The Parts of a Chart (Chart Elements)</i>	180
	<i>Selecting Part of a Chart</i>	181
	<i>Selecting a Data Point or Legend Entry</i>	181
	<i>Formatting Part of a Chart</i>	182
	<i>Using the Formatting Task Bar</i>	182
	<i>Worked Example: Setting the Gradient Fill for a Chart Title</i>	183
23.8	Showing/Hiding Parts of a Chart	183
23.9	Specific Chart Element Consideration	185
	<i>Working with Data Tables</i>	185
	<i>Data Labels</i>	185
	<i>Axes, Scaling, Tick Marks and Gridlines</i>	186
23.10	Editing Data	187
	<i>Changing the Data being Charted Visually</i>	187
	<i>Switching Rows and Columns</i>	187
	<i>Filtering Data and Labels</i>	188

24	ADVANCED CHARTS (1)	Page
24.1	Overview	189
24.2	Combination Charts	190
24.3	Trendlines	191
	<i>Some Types of Trendline</i>	191
	<i>Adding Trendlines to Charts</i>	191
	<i>Choosing the Trendline Type</i>	192
	<i>Displaying Regression Statistics</i>	192
	<i>Extrapolating Trendlines</i>	192
24.4	Scatter and Bubble Diagrams	193
	<i>Scatter Diagrams</i>	193
	<i>Displaying a Regression Line</i>	194
	<i>Bubble Charts</i>	194
	<i>Customising Bubble Charts</i>	195
24.5	Stock Charts	196
24.6	Lines and Up/Down Bars	197
	<i>Up/Down Bars</i>	197
	<i>Series Lines</i>	197
24.7	Error Bars	198
24.8	Picture Charts	199
	<i>Tiling Pictures</i>	199

25	ADVANCED CHARTS (2)	Page
25.1	Sunburst Charts	201
25.2	Treemap Charts	202
25.3	Waterfall or Bridge Charts	203
25.4	Histograms	204
25.5	Box and Whiskers Charts	205
	<i>Creating a Box and Whiskers Chart</i>	205
	<i>Interpreting the Box and Whiskers</i>	206
25.6	Pareto Charts	207



## TABLE OF CONTENTS (7 of 7)

26	SPARKLINES	Page
26.1	Introduction to Sparklines	208
	<i>What Sparklines Are</i>	208
	<i>Sparklines can Contain Data</i>	208
26.2	Creating Sparklines	209
26.3	Grouping and Ungrouping Sparklines	210
	<i>Ungrouping Sparklines</i>	210
	<i>Grouping Sparklines</i>	210
26.4	Removing Sparklines	211
26.5	Editing Sparklines	211
	<i>Changing the Sparkline Type</i>	212
	<i>Changing Line and Marker Colours</i>	212
	<i>Sparkline Markers</i>	213
	<i>Changing the Axis Settings</i>	213

27	GOAL-SEEKING	Page
27.1	Goal-Seeking Example	214
27.2	Using Goal-Seeking	215

28	SCENARIOS	Page
28.1	Overview of Scenarios	216
28.2	Creating a Scenario	217
	<i>Base case scenarios</i>	217
	<i>Starting the Scenario Manager</i>	217
	<i>Creating a Scenario</i>	218
28.3	Showing Different Scenarios	219
	<i>Showing Different Scenarios using the Ribbon</i>	219
	<i>Switching Scenarios using the Quick Access Toolbar</i>	219
28.4	Editing, Deleting and Merging Scenarios	220
	<i>Editing or Deleting Scenarios</i>	220
	<i>Merging Scenarios</i>	220
28.5	Summarising Scenarios	221

29	EXCEL SHORTCUT KEYS	Page
29.1	CTRL and SHIFT Key Combinations	222
	<i>SHIFT and CTRL keys</i>	222
	<i>General CTRL Keys in Excel</i>	223
	<i>CTRL Keys with Letters</i>	224
29.2	Function Keys	225
	<i>F1 to F6 Keys</i>	225
	<i>F7 to F12 Keys</i>	226
29.3	Other Special Keys	227
	<i>Special Keys – Part 1</i>	227
	<i>Special Keys – Part 2</i>	228
	<i>Special Keys – Part 3</i>	229



# CHAPTER 1 - FORMULAE AND FUNCTIONS

## 1.1 Basic Formulae

You can type a *formula* into a cell to calculate a new value based on data you've already entered:

	A	B	C	D
1	Month	Invoices sent	Paid on time	% on time
2	Jan	5810	3977	=C2/B2

All formulae begin with an = sign. This takes the value in cell **C2**, and divides it by the value in cell **B2**.

## Operators

*Operators* are the symbols that tell Excel to add, subtract, etc. The common ones used are:

Symbol	What it means	Example	Result (if B2 = 5 and C2 = 2)
+	To add	= B2 + C2	7
-	To subtract	= B2 - C2	3
*	To multiply	= B2 * C2	10
/	To divide	= B2 / C2	2.5
^	To take to the power of	= B2 ^ C2	25 (ie 5 <sup>2</sup> )
&	Concatenation (joining)	= B2 & C2	52 (ie 5 and 2 joined together)

## Brackets in Formulae

*Brackets* force Excel to calculate some parts of a formulae first (in Excel multiplication/division normally occur before addition/subtraction, but you can override this). For example:

X	✓	fx	=C1+D1*E1
C	D	E	F
2	3	7	23

Without brackets

2 plus 3 times 7 = 2 plus 21 = 23

X	✓	fx	=(C1+D1)*E1
C	D	E	F
2	3	7	35

With brackets

(2 plus 3) times 7 = 5 times 7 = 35



Remember your **BODMAS!** This natty acronym gives the order in which calculation rules are applied, as shown on the right.

**B** rackets  
**O** ver  
**D** ivision  
**M** ultiplication  
**A** ddition  
**S** ubtraction

## 1.2 Creating Formulae

Here's how to create a typical formula, such as the one shown on the previous page:

	A	B	C	D
1	Month	Invoices sent	Paid on time	% on time
2	Jan	5810	3977	=
3	Feb	5233	3881	
4	Mar	4138	3755	
5	Apr	5994	4887	

- a) Click in the cell where you want to put your answer, and type an = sign to begin your formula.

C2				
	A	B	C	D
1	Month	Invoices sent	Paid on time	% on time
2	Jan	5810	3977	=C2
3	Feb	5233	3881	

- b) Click on the first cell to use in your calculation, or type in its cell reference (here it's C2).


D2				
	A	B	C	D
1	Month	Invoices sent	Paid on time	% on time
2	Jan	5810	3977	=C2/
3	Feb	5233	3881	

- c) Type in an operator (here we type / to show we want to divide by something).

IF				
	A	B	C	D
1	Month	Invoices sent	Paid on time	% on time
2	Jan	5810	3977	=C2/B2
3	Feb	5233	3881	
4	Mar	4138	3755	

- d) Click on the next cell that you want to reference, or type in the cell address (here it's B2).

D2				
	A	B	C	D
1	Month	Invoices sent	Paid on time	% on time
2	Jan	5810	3977	68.45%
3	Feb	5233	3881	

- e) Press  or click on the tick symbol to confirm your formula (here we've also formatted the cell containing the answer, so that it appears as 68.45% rather than 0.6845).

## 1.3 Editing Formulae

After you've created a formula, you can edit it in a couple of ways:

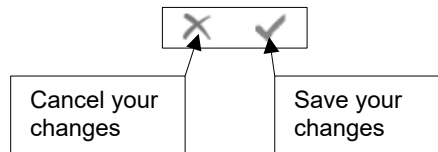
IF	:	X	✓	<i>fx</i>	=C2/B2	I
	A	B	C	D		
1	Month	Invoices sent	Paid on time	% on time		
2	Jan	5810	3977	=C2/B2		
3	Feb	5233	3881			

Either click on the cell, then click in this formula bar to make changes to the formula it contains ...

	A	B	C	D		
1	Month	Invoices sent	Paid on time	% on time		
2	Jan	5810	3977	=C2/B2	I	
3	Feb	5233	3881			

... or double-click in the cell to change the formula within the cell (you can also press **F2** to do this).

Whichever method you choose, press **Enter** when you've finished to save your changes, or **Esc** to cancel them, or click on one of the tools shown below:



## 1.4 Copying Formulae

When you copy a formula containing cell references to other cells, Excel will automatically update the cell references.



*This key feature of spreadsheets is called relative cell referencing, and is explained in more detail overleaf.*

### The Easiest Way to Copy a Formula

You can copy any formula up, down, left or right. Here's an example of copying a formula down.

	A	B	C	D
1	Month	Invoices sent	Paid on time	% on time
2	Jan	5810	3977	68.45%
3	Feb	5233	3881	
4	Mar	4138	3755	
5	Apr	5994	4882	
6	May	6006	4125	

In this example we want to copy this formula down to work for the other four months too.

To copy this formula down:

	A	B	C	D
1	Month	Invoices sent	Paid on time	% on time
2	Jan	5810	3977	68.45%
3	Feb	5233	3881	
4	Mar	4138	3755	
5	Apr	5994	4882	
6	May	6006	4125	

- a) Position the mouse button at the bottom right corner of the cell that you want to copy, so that it turns into what's called the **AutoFill** handle (a black cross).

	A	B	C	D
1	Month	Invoices sent	Paid on time	% on time
2	Jan	5810	3977	68.45%
3	Feb	5233	3881	
4	Mar	4138	3755	
5	Apr	5994	4882	
6	May	6006	4125	
7				

- b) Click and drag down to highlight the cells beneath – when you release the mouse button, Excel will copy the formula down.

C	D
on time	% on time
3977	68.45%
3881	74.16%
3755	90.74%
4882	81.45%
4125	68.68%

- c) The formula give different numbers because they're referring to different cells, as can be seen from looking at the bottom figure of 68.68%.

	A	B	C	D
1	Month	Invoices sent	Paid on time	% on time
2	Jan	5810	3977	68.45%
3	Feb	5233	3881	74.16%
4	Mar	4138	3755	90.74%
5	Apr	5994	4882	81.45%
6	May	6006	4125	=C6/B6
7				




*Actually, an even easier way to copy a formula down is to double-click when you get the AutoFill handle. Excel will then copy the formula down almost by magic, using the column immediately to the left to determine how far to go. Note that this only works when copying down (you can't use it to copy up, right or left).*

## Other Ways to Copy a Formula

You can, of course, use all of the standard Windows ways to copy formulae too!

B	C	D
Invoices sent	Paid on time	% on time
5810	3977	68.45%
5233	3881	
4138	3755	
5994	4882	
6006	4125	

- a) Right-click on the cell that you want to copy and choose **Copy** (or press **Ctrl** + **C**, or click on the  **Copy** tool on the **HOME** tab of the ribbon).

- b) The cell or cells that you are copying will get a jazzy line round them!

C	D
Paid on time	% on time
3977	68.45%
3881	
3755	

C	D	E
Paid on time	% on time	
3977	68.45%	
3881		
3755		
4882		
4125		

- c) Right-click on the cells which you want to paste the formula onto, and choose the tool shown (or press **Ctrl** + **V**, or click on the tool shown on the right on the **HOME** tab of the ribbon).



- d) Press **Esc** to clear these dashed lines if they are annoying you (although they're harmless!).

C	D
Paid on time	% on time
3977	68.45%
3881	74.16%
3755	88.74%

## How Relative Cell Referencing Works

When you copy a formula, Excel uses *relative cell referencing*:

	A	B	C	D
1	Month	Invoices sent	Paid on time	% on time
2	Jan	5810	3977	=C2/B2
3	Feb	5233	3881	74.16%
4	Mar	4138	3755	90.74%
5	Apr	5994	4882	81.45%
6	May	6006	4125	68.68%

The original formula is read by Excel as: "take the cell one to the left on the same row, and divide it by the cell two to the left on the same row".

	A	B	C	D
1	Month	Invoices sent	Paid on time	% on time
2	Jan	5810	3977	68.45%
3	Feb	5233	3881	74.16%
4	Mar	4138	3755	90.74%
5	Apr	5994	4882	81.45%
6	May	6006	4125	=C6/B6

The copied formulae all do exactly the same thing, but give different results because they refer to cells on different rows!



There is a way in Excel to turn this behaviour off and use absolute referencing instead (this is covered in a later courseware chapter, including examples showing why you'd want to do this).

## 1.5 Functions

A *function* can be used in a formula to perform specialised calculations. Here's an example:

	A	B
1	Month	Invoices sent
2	Jan	5810
3	Feb	5233
4	Mar	4138
5		=B2+B3+B4
6		

You could calculate the total for this column by adding each individual cell together ...

... but it's more efficient to use the **SUM** function, which will add together all of the values in a range of cells.

	A	B
1	Month	Invoices sent
2	Jan	5810
3	Feb	5233
4	Mar	4138
5		=SUM(B2:B4)
6		



There are hundreds of functions in Excel, covering everything from summing cells through to advanced financial, statistical and mathematical calculations.

### Basic Functions

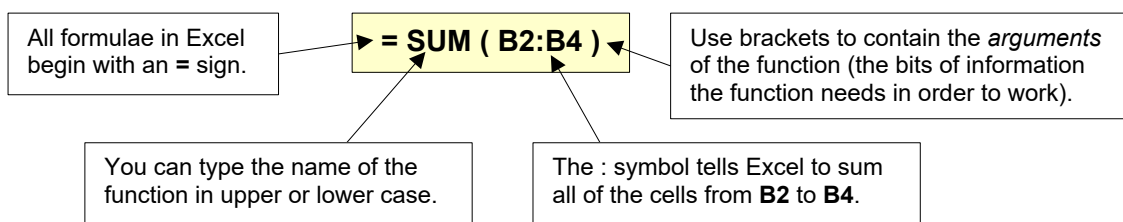
Here are four of the most commonly used functions in Excel:

Here we've used four functions to work out the sum and average of the 3 sales figures for **Jan**, **Feb** and **Mar**, and also the highest and lowest of them.

	A	B	C
1	Month	Sales	
2	Jan	5810	
3	Feb	5233	
4	Mar	4138	
5			
6		Month 1-3 statistics	
7			
8		Result	Formula
9	Total	15,181.00	=SUM(B2:B4)
10	Average	5,060.33	=AVERAGE(B2:B4)
11	Maximum	5810	=MAX(B2:B4)
12	Minimum	4138	=MIN(B2:B4)

### Structure of a Function

All Excel functions have the same structure:



## Typing a Function

If you know the name of the function that you want to use, you can type it into a cell:

	A	B
1	Month	Invoices sent
2	Jan	5810
3	Feb	5233
4	Mar	4138
5	Apr	5994
6	May	6006
7		=aver
8		
9		
10		
11		

- a) Type = followed by the name of the function you want to use. When you've identified it sufficiently, you can either press the key, or alternatively double-click on the function name to select it (to save yourself typing) to get:

4	Mar	4138	
5	Apr	5994	
6	May	6006	
7		=AVERAGE(	
8		AVERAGE(number1, [number2], ...)	

- b) Select the cells which you want to be the argument for your function (here the cells whose average we want to calculate).

	A	B	C
1	Month	Invoices sent	
2	Jan	5810	
3	Feb	5233	
4	Mar	4138	
5	Apr	5994	
6	May	6006	
7		=AVERAGE(B2:B6)	
8		AVERAGE(number1, [number2], ...)	

- c) Press to create your formula (Excel will fill in the last closing bracket for you) to get:
- =AVERAGE(B2:B6)**

	A	B
1	Month	Invoices sent
2	Jan	5810
3	Feb	5233
4	Mar	4138
5	Apr	5994
6	May	6006
7		5436.2

## Using AutoSum to Create Quick Totals, Averages, Etc.

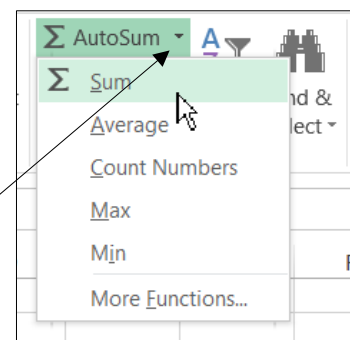
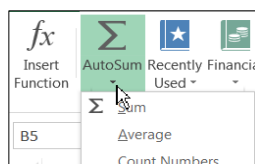
For the basic functions of summing, averaging, counting and taking the maximum or minimum value in a range, use the AutoSum tool to speed things up:

	A	B
1	Month	Invoices sent
2	Jan	5810
3	Feb	5233
4	Mar	4138
5		
6		

- a) Click on the cell where you want the answer to go (here we'll calculate the total invoices sent for January through to March).

	A	B
1	Month	Invoices sent
2	Jan	5810
3	Feb	5233
4	Mar	4138
5		=SUM(B2:B4)
6		SUM(number1, [number2], ...)
7		

- b) Click on this arrow on the **Home** tab to choose a different function (or just click on the AutoSum tool if you just want to create a total). Note that you can also find this tool on the **Formulas** tab:



- c) Excel will guess what you want to sum (or average, or count, etc.) – usually this will be the block of numbers directly above or to the left of the current cell. If Excel has guessed correctly, press to confirm the formula; otherwise select the block of cells you did want to work with, or press **Esc** to cancel your formula.



## The Quickest Way to Sum

People sum so frequently in Excel that there is a short-cut key devoted to it:

	A	B
1	Month	Invoices sent
2	Jan	5810
3	Feb	5233
4	Mar	4138
5		

a) Select the block of cells you want to sum and the blank cell where the answer should go.

	A	B
1	Month	Invoices sent
2	Jan	5810
3	Feb	5233
4	Mar	4138
5		=SUM(B2:B4)

b) Type **Alt** + **=** to put the sum formula into the blank cell.

## The Function Wizard

The best way to choose a function in Excel is to use the *function wizard*. To show how to use this, consider this example:

	A	B	C	D	E
1					
2					
3					
4					
5			Interest	5.50%	
6			Term of mortgage	25.00	
7			House price	£100,000	
8					
9			Annual mortgage	(£7,455)	
10					
11					

We want to work out the annual mortgage on a £100,000 broom cupboard in London, given a 25 year term and an interest rate of 5.5%.

	A	B	C	D	E
1					
2					
3					
4					
5			Interest	5.50%	
6			Term of mortgage	25.00	
7			House price	£100,000	
8					
9			Annual mortgage	=PMT(D5,D6,D7)	
10					
11					


As always in Excel, there's an app for this (although in Excel they're called functions, not apps). Here we'll use the **PMT** function (which stands for **PayMenT**, before you ask).

You're unlikely to be able to guess that this function exists, so here's how to find it (or any other function for that matter). First invoke the wizard:

Click on the cell where you want your answer to go, then click on this tool (or press **fx** + **F3** to invoke the function wizard).

	A	B	C
9			
10			
11			
12			
13			
14			
15			

You can now choose which function you want to work with:

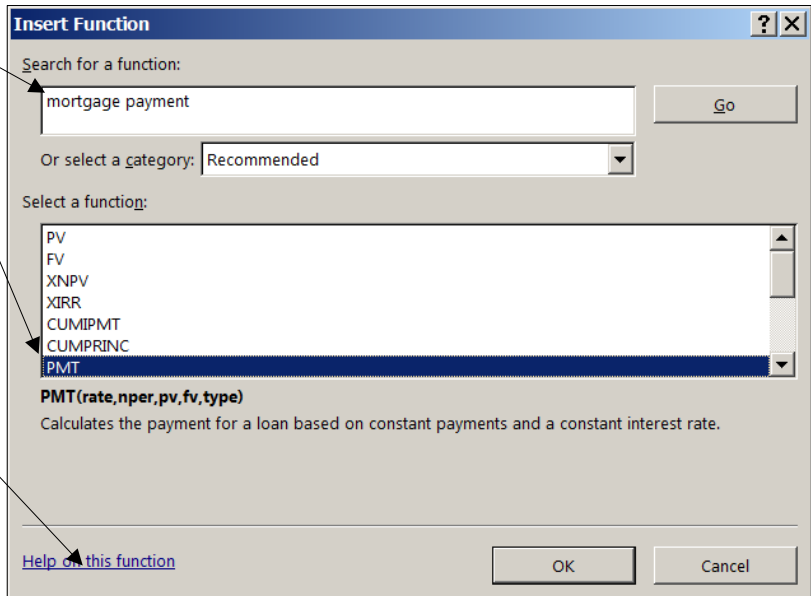
a) Type in a description of what you want to do, and press .

b) See if you can find a function which looks like it will help in the list presented to you.

c) Click on this link to get excellent help on this function – here's how the **PMT** function help starts:

## PMT function

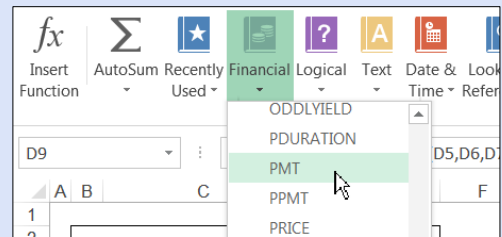
**PMT**, one of the financial functions, calculates the payment for a loan based on constant payments and a constant interest rate.



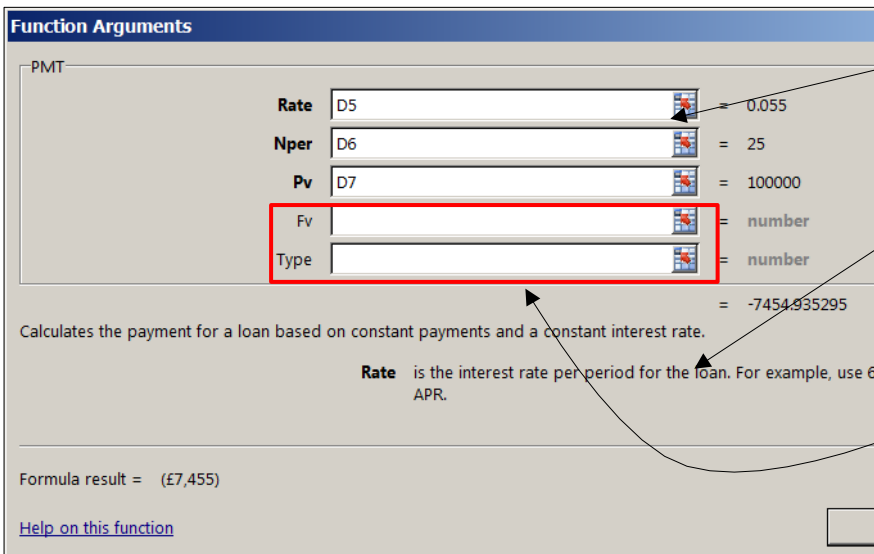
The **Insert Function** dialog box is shown. The search bar contains 'mortgage payment'. The 'Or select a category' dropdown is set to 'Recommended'. The 'Select a function' list shows several financial functions, with **PMT** selected. Below the list, the syntax **PMT(rate,nper,pv,fv,type)** is displayed, followed by the description: 'Calculates the payment for a loan based on constant payments and a constant interest rate.' At the bottom, there is a link 'Help on this function' and 'OK' and 'Cancel' buttons.



*If you know which category of function you're looking for, it can sometimes be quicker to find it using the **FORMULA** tab of the ribbon.*



Finally, select **OK** in the above dialog box. You can now complete your function:



The **Function Arguments** dialog box for the **PMT** function is shown. The arguments are: **Rate** (D5) = 0.055, **Nper** (D6) = 25, **Pv** (D7) = 100000, **Fv** (empty) = number, and **Type** (empty) = number. The formula result is calculated as (£7,455). The description states: 'Calculates the payment for a loan based on constant payments and a constant interest rate.' A note explains that **Rate** is the interest rate per period for the loan. The **Fv** and **Type** arguments are highlighted with a red box.

a) Click on these red blobs to choose a cell for each argument.

b) When you click in an argument, Excel tells you how it should be used.

c) Arguments shown in faint type (not bold) are optional. For this function you can miss them out and they will take sensible values, although this isn't always the case in Excel!

## 1.6 Status Bar Calculations

A quick way to view the results of formulae is to use the status bar:

	A	B
1	Month	Invoices sent
2	Jan	5810
3	Feb	5233
4	Mar	4138
5		

Want to know the average of the selected cells?

Find the relevant statistic in the status bar at the bottom right of Excel.

AVERAGE: 5060.333333 COUNT: 3 SUM: 15181

You can right-click on the status bar to change the statistics displayed:

For example, you could select **Minimum** as here to display the minimum value for any range of selected cells in the status bar.

- ✓ Average 5060.333333
- ✓ Count 3
- Numerical Count
- Minimum
- Maximum
- ✓ Sum 15181
- ✓ Upload Status
- ✓ View Shortcuts
- ✓ Zoom Slider
- ✓ Zoom 100%


AVERAGE: 5060.333333 COUNT: 3 SUM: 15181

## CHAPTER 2 - MOVING AND SELECTING IN EXCEL

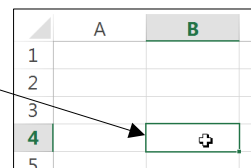
### 2.1 Moving Around in Excel

To be able to use the different parts of a workbook, you need to be able to move to them. You can move around a workbook using the mouse or keyboard, or by changing the viewing scale.

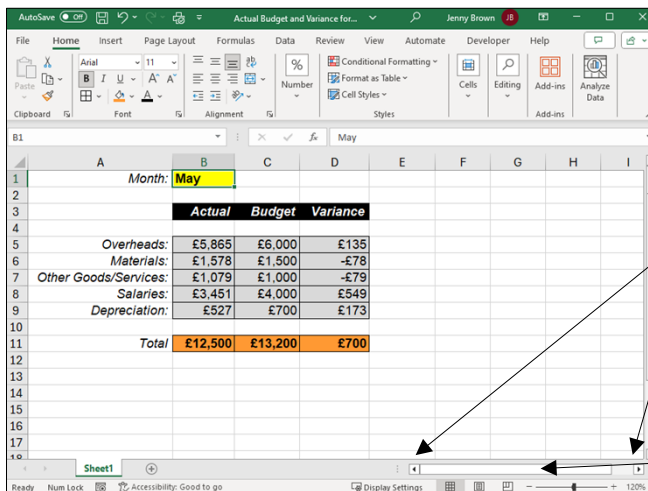
#### Using the Mouse to Move Around


You can move to any cell on the worksheet, simply by clicking the  shaped mouse on the required cell.

Once you've clicked on the required cell, it becomes the *currently selected cell* – denoted by the box around the cell.



If you can't see the cell you want to move to on the screen then you can use the *scroll bars* to move further down and/or further across the worksheet:



Click and drag on this scroll bar to move further down. Hold down  to move more quickly.

You can click the arrows at either end of a scroll bar to move one row or column at a time. You can also click and hold the mouse button to move more quickly.

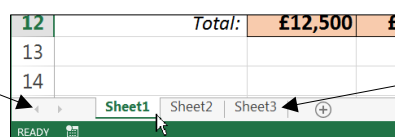
Click and drag on this scroll bar to move further across. Hold down  to move more quickly.



*If you have a mouse with a "scroll wheel", you can use it to scroll up and down on a worksheet.*

You can also use the mouse to move to different worksheets:










You can use these arrows to view worksheet tabs that are not currently viewable.



To move to a different worksheet – just click on the tab.

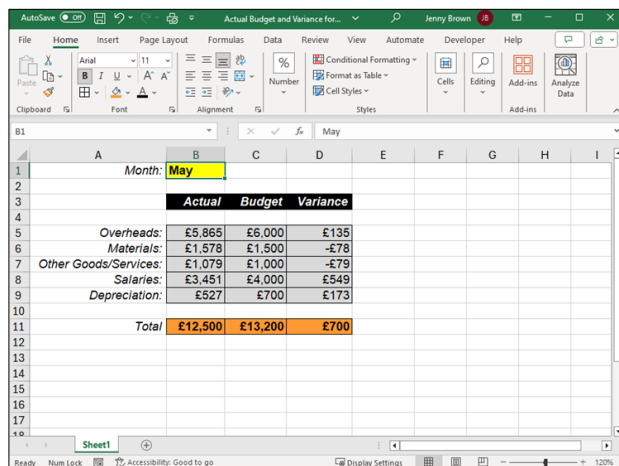
## Keyboard Shortcuts for Moving Around

There are many keyboard shortcuts that you can use to quickly move around a workbook. The table below summarises the main ones:

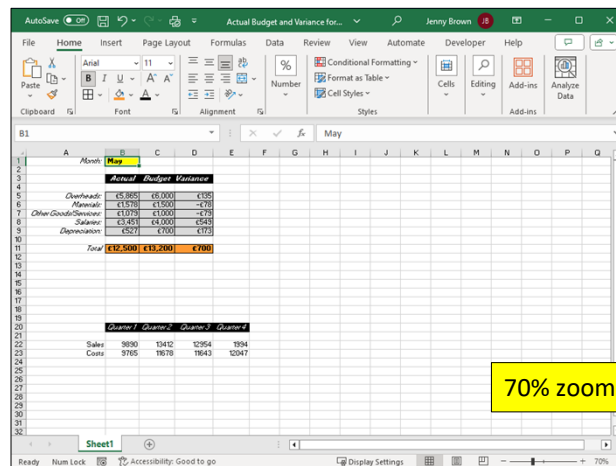
Key(s)	What they do
 ,  ,  , 	Moves the cursor one cell in the appropriate direction
<b>Ctrl</b> +  , <b>Ctrl</b> +  <b>Ctrl</b> +  , <b>Ctrl</b> + 	Moves the cursor to the appropriate end of the currently selected block of cells
<b>Home</b>	Moves the cursor to the first column of the current row
<b>Ctrl</b> + <b>Home</b>	Moves the cursor to the first cell of the sheet ( <b>A1</b> )
<b>Ctrl</b> + <b>End</b>	Moves the cursor to the bottom right corner of your sheet
<b>Page Down</b> , <b>Page Up</b>	Goes one “screen” down or up
<b>Alt</b> + <b>Page Down</b>	Goes one “screen” right
<b>Alt</b> + <b>Page Up</b>	Goes one “screen” left
<b>F5</b>	Lets you choose a cell reference to go to, then type 
<b>Ctrl</b> + <b>Page Down</b>	Go to the next worksheet in the workbook
<b>Ctrl</b> + <b>Page Up</b>	Go to the previous worksheet in the workbook

## Zooming the View

You can see more of your worksheet in the same screen area by using the zoom control tool to zoom out (or in):



Click and drag the slider or use + / - to zoom in/out.



Here zoom has been set to 70% to see more.




If you have a mouse with a “scroll wheel”, you can hold **Ctrl** and scroll the wheel to zoom in and out.

## 2.2 Selecting Cells

Just about everything you do in Excel requires you to first select the cell or cells that you want to make the changes to.

	A	B	C	D
1	Month:	May		
2				
3		Actual	Budget	Variance
4				
5	Overheads:	£5,865	£6,000	£135
6	Materials:	£1,578	£1,500	-£78
7	Other Goods/Services:	£1,079	£1,000	-£79
8	Salaries:	£3,451	£4,000	£549
9	Depreciation:	£527	£700	£173

A block of cells is called a *range*. Here a range of 6 cells has been selected.






The selected range has a different coloured border (usually green) and the bottom right corner has this icon: 

To reference this range you use:  
**top left cell : bottom right cell**  
The reference for this range is **B5:C7**

The first cell you click on when you select a range will be a different colour to the rest (remains white if no cell background shading has been added). This is called the *active cell*.

### Selecting Single Cells

To select a single cell:

- Simply click the  mouse shape on the required cell; or
- Press any cursor movement key like , ,  or  until you reach the desired cell.

The *Name Box* at the top left always gives the cell reference of the currently selected cell.


	A	B
1	Month:	Ma
2		
3		Act

The selected cell is denoted by the outlined box (usually green).


### Selecting a Range of Cells

The easiest way to select a range is by simply clicking and dragging with the mouse:


	Actual	Budget	Variance
Overheads:	£5,865	£6,000	£135
Materials:	£1,578	£1,500	-£78
Other Goods/Services:	£1,079	£1,000	-£79
Salaries:	£3,451	£4,000	£549
Depreciation:	£527	£700	£173

a) Move the cursor over a corner of the range you want to select (usually top left corner). Make sure the mouse changes to this shape: 


Overheads:	£5,865	£6,000	£135
Materials:	£1,578	£1,500	-£78
Other Goods/Services:	£1,079	£1,000	-£79
Salaries:	£3,451	£4,000	£549
Depreciation:	£527	£700	£173

b) With the  mouse shape, click and hold the left mouse button down and drag the mouse to the opposite corner of the range (usually bottom right). Release the mouse button to select the range.

## Selecting a Large Range of Cells

It is often tricky to select a large range by dragging the mouse, so instead you can use the  key as shown below:


a) Start by selecting/clicking just the top left cell in the range.

b) Use the scroll bars to find the bottom right corner of your range. Hold down the  key and click on this bottom right cell to select the entire range.


	L	M	N	O	P
41				£341.72	
42				£150.00	
43				£14.00	
44				£27.00	
45				£19.25	
46		£31.18		£31.18	
47	£245.00		£2,578.00	£3,303.00	
48		£100.00		£225.00	
49	£605.00	£1,142.18	£2,603.00	£57,35.07	
50					


	A	B
1	<b>Orchestra Income - Year to Date</b>	
2		
3	Income Type	Income Description
4	Membership Income	Full-year Membership
5	Membership Income	Half-year Membership
6	Membership Income	Friends of Membership
7	Concert Income	Autumn Concert
8	Concert Income	Christmas Concert

## Selecting Multiple Ranges

You can select several separate ranges by holding down the  key for each range you want to add whilst you click and drag the extra ranges.

a) Select the first range by clicking and dragging as normal.

b) Hold down the  key while you click and drag the second range.

c) Continue holding down the  key while you select more ranges until you have selected them all.


	A	B	C	D
1	Month:	May		
2				
3		Actual	Budget	Variance
4				
5	Overheads:	£5,865	£6,000	£135
6	Materials:	£1,578	£1,500	-£78
7	Other Goods/Services:	£1,079	£1,000	-£79
8	Salaries:	£3,451	£4,000	£549
9	Depreciation:	£527	£700	£173
10				

	A	B	C	D
1	Month:	May		
2				
3		Actual	Budget	Variance
4				
5	Overheads:	£5,865	£6,000	£135
6	Materials:	£1,578	£1,500	-£78
7	Other Goods/Services:	£1,079	£1,000	-£79
8	Salaries:	£3,451	£4,000	£549
9	Depreciation:	£527	£700	£173
10				




## Selecting Entire Rows and Columns

You can easily select entire rows and columns by clicking the row numbers or column letters.

To select a column, move the mouse over the column letter so that it changes shape to this  and then click to select that column.

	A	B	C	D
1	Month:	May		
2				
3		Actual	Budget	Variance
4				
5	Overheads:	£5,865	£6,000	£135
6	Materials:	£1,578	£1,500	-£78
7	Other Goods/Services:	£1,079	£1,000	-£79
8	Salaries:	£3,451	£4,000	£549

To select a row, move the mouse over the row number so that it changes shape to this  and then click to select that row.

	A	B	C	D
1	Month:	May		
2				
3		Actual	Budget	Variance
4				
5	Overheads:	£5,865	£6,000	£135
6	Materials:	£1,578	£1,500	-£78
7	Other Goods/Services:	£1,079	£1,000	-£79

To select multiple adjacent rows/columns, click and drag across the column letters/row numbers. To select multiple non-adjacent rows/columns, hold down **Ctrl** while you click on the column letter/row number.

## Selecting an Entire Worksheet

You can select every cell on a worksheet (including all the blank cells) by clicking at the top left corner:

Click here to select the entire worksheet.

	A	B	C	D
1	Month:	May		
2				
3		Actual	Budget	Variance
4				
5	Overheads:	£5,865	£6,000	£135
6	Materials:	£1,578	£1,500	-£78
7	Other Goods/Services:	£1,079	£1,000	-£79



You can also press **Ctrl** + **A** to select either the entire worksheet or the current region of data:





	A	B	C	D
1	Month:	May		
2				
3		Actual	Budget	Variance
4	Overheads:	£5,865	£6,000	£135
5	Materials:	£1,578	£1,500	-£78
6	Other Goods/Services:	£1,079	£1,000	-£79
7	Salaries:	£3,451	£4,000	£549
8	Depreciation:	£527	£700	£173
9	Total:	£12,500	£13,200	£700
10				
11				

If you press **Ctrl** + **A** here, Excel selects the entire worksheet.

	A	B	C	D
1	Month:	May		
2				
3		Actual	Budget	Variance
4	Overheads:	£5,865	£6,000	£135
5	Materials:	£1,578	£1,500	-£78
6	Other Goods/Services:	£1,079	£1,000	-£79
7	Salaries:	£3,451	£4,000	£549
8	Depreciation:	£527	£700	£173
9	Total:	£12,500	£13,200	£700
10				

If you press **Ctrl** + **A** here, Excel looks for surrounding blank cells and selects the "used" cells area.

## De-Selecting Cells

To de-select, all you have to do is click the mouse on a different worksheet cell or press one of the cursor movement keys like , ,  or  to move to a different cell.

	A	B	C	D
1	Month:	May		
2				
3		Actual	Budget	Variance
4				
5	Overheads:	£5,865	£6,000	£135
6	Materials:	£1,578	£1,500	£-78
7	Other Goods/Services:	£1,079	£1,000	£-79
8	Salaries:	£3,451	£4,000	£549
9	Depreciation:	£527	£700	£173
10				
11	Total:	£12,500	£13,200	£700
12				




These 3 ranges are currently selected...

	A	B	C	D
1	Month:	May		
2				
3			Actual	Budget Variance
4				
5	Overheads:	£5,865	£6,000	£135
6	Materials:	£1,578	£1,500	£-78
7	Other Goods/Services:	£1,079	£1,000	£-79
8	Salaries:	£3,451	£4,000	£549
9	Depreciation:	£527	£700	£173
10				
11	Total:	£12,500	£13,200	£700
12				

... by clicking here, they are de-selected.

## Using the Keyboard to Select Cells

There are many keyboard shortcuts for selecting cells. The table below summarises the main ones:

Key(s)	What they do
 + any of the arrow keys	Extends the current selection one row or column in the appropriate direction.
Ctrl +  + any of the arrow keys	Selects from the active cell to the end of the current region of cells in the appropriate direction.
Ctrl + Space Bar	Selects an entire column.
 + Space Bar	Selects an entire row.
Ctrl + A	Selects all the cells in the current region – if you have a cell selected within a block of data this will select the whole block of data, otherwise it will select all the cells on the worksheet.

Blank lined area for writing.



Blank lined area for writing.



Blank lined area for writing.



Blank lined paper for writing.



**Wise Owl**  
Training

Blank lined paper for writing.



**WiseOwl**  
Training



Blank lined paper for writing.



Blank lined paper for writing.



**Wise Owl**  
Training

Blank lined paper for writing.



**Wise Owl**  
Training

Blank lined paper for writing.






































Blank lined paper for writing.



**WiseOwl**  
Training

## What we do!

		Basic training	Advanced training	Systems / consultancy
Office	Microsoft Excel			
	VBA macros			
	Office Scripts			
	Microsoft Access			
Power BI, etc	Power BI and DAX			
	Power Apps			
	Power Automate (both)			
SQL Server	SQL			
	Reporting Services			
	Report Builder			
	Integration Services			
	Analysis Services			
Coding	Visual C#			
	VB programming			
	MySQL			
	Python			



**WiseOwl**  
Training

