



# Spreadsheet Methods 5N1977

## 2. Explore Key Spreadsheet Elements

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**1. EXPLORE THE FOLLOWING TERMS: SPREADSHEET, ROW, COLUMN, CELL, CELL REFERENCE, LABEL, VALUE & FORMULA**

**Spreadsheet**

A spreadsheet is an interactive computer program used for keeping track of data (usually figures). The information is arranged in **rows** and **columns** in a grid. Spreadsheets are very useful for formatting, organising and analysing data.

The data that is stored in a spreadsheet can be **numbers**, **text** or **formula**. Just like in math, formula are used for calculation on figures. These formulas are built into the spreadsheet software and are known as **functions**.

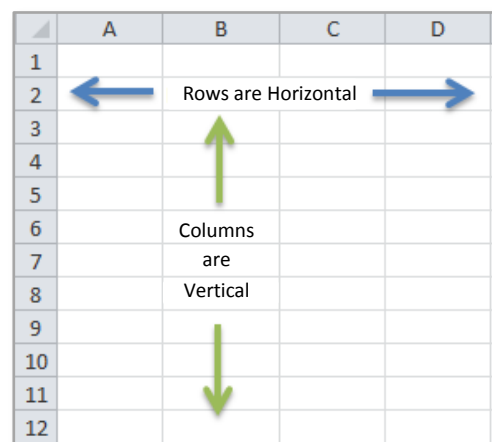
	A	B	C	D	E	F	G
1							
2				<b>Furniture Sales Monaghan</b>			
3							
4	<b>Today</b>						
5							
6	<b>First Name</b>	<b>Surname</b>	<b>Product</b>	<b>Gross Price</b>	<b>Quantity</b>	<b>Delivery Fee</b>	<b>Total Price</b>
7	Trish	O'Brien	Bunk Bed	€180.00	1	10	€190.00
8	Andrew	Mulligan	Bunk Bed	€180.00	1	10	€190.00
9	Mary	Keegan	Bunk Bed	€180.00	2	10	€370.00
10	Kay	Kelleher	Dressing Table	€190.00	1	10	€200.00
11	Dermot	Rogers	Kitchen Table	€320.00	1	0	€320.00
12	Nuala	McCormack	Leather Sofa	€560.00	2	0	€1,120.00
13	Emma	Winters	Leather Sofa	€560.00	3	0	€1,680.00
14	Tom	Treanor	Nested Table	€125.00	2	15	€265.00
15	Eileen	Nolan	TV Table Unit	€89.00	2	15	€193.00
16	Sharon	O'Gorman	TV Table Unit	€89.00	3	15	€282.00
17						<b>Total Sales</b>	€4,810.00
18						<b>Average Sales</b>	€481.00
19						<b>Maximum Sale</b>	€1,680.00
20							

**Row**

The lines across the spreadsheet horizontally are known as **rows**, they are identified by the numbers 1, 2, 3, etc.

**Column**

The lines down the spreadsheet vertically are known as **columns**, they are identified by letters A, B, C, etc. After the column Z, columns are then identified by two or more letters for example AA, AB, AC, etc.

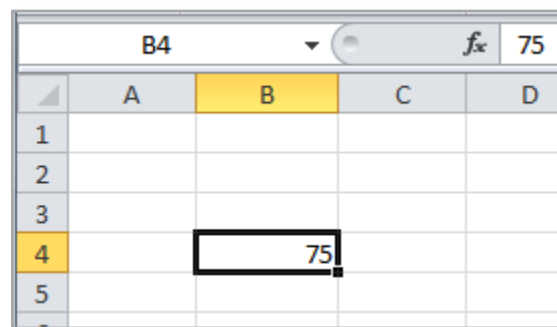


## Cell

Where a **row** and a **column** intersect there is a small rectangular box this is known as a cell. This is the storage unit for data in a spreadsheet. Each piece of information is stored in a cell and every spreadsheet has thousands of cells, because of this each cell has a unique **cell reference** to identify it. Cells can be **formatted** in many different ways they can be resized, filled with a colour, given a border and merged to name some formatting (see LO 4).

## Cell Reference

Each individual **cell** in a spreadsheet is identified by its **cell reference** this could be considered the address of the cell. This is found by reading the column letter and the row number. **Note:** The column letter is always listed first. In this example the cell with the number 75 in it, is identified as B4.



The cell reference of the selected cell is always shown in the **name box** above the A column. The value or content of the selected cell is always shown in the **formula bar** shown here above the D column.

## Cell Range

A group of cells can be highlighted together in what is known as a **cell range** these are identified by **cell reference** the first cell in the upper left corner and the last cell in the bottom right corner of the range. These two references are separated by a colon ( : ). An example of a **cell range** would be (B2:B8) or (A3:D7). Cell ranges are used in formula.

## Label

A **label** refers to a text entry, used to describe information in a column or row of data. On the previous page there are labels on the Furniture Sales example in cell A4 and across row 6. A label can also refer to the headings and titles in graphs.

## Value

The term **value** in spreadsheet software refers to number data, such as 100 or €29.99 which is stored in the cells of the spreadsheet.

## Formula

A formula is a mathematical equation or set of commands used to generate a specific result or value. Formula may include functions, cell references, ranges, numbers and mathematical operators.

An example of a formula is as follows: **=SUM(C2:C8)\*SUM(B2:B8)**

**Task 1:** Identify the following terms on the spreadsheet below: Row, Column, Cell, Cell Reference, Cell Range, Label, Value and Formula.

The screenshot shows a spreadsheet with the following data:

1	Computer Studies Class Results									
2										
3	Subject	Tom	Mark	Jane	Mary	Paul	Rose	John	Peter	
4										
5	Spreadsheets	75	72	69	78	65	89	85	75	
6	Word Processing	84	68	64	89	67	56	77	71	
7	Text Production	64	53	49	67	78	75	55	56	
8	Communications	79	77	54	61	84	59	67	60	
9	Business Management	65	74	63	54	78	63	51	56	
10	Web Authoring	66	62	79	67	44	52	72	56	
11	Databases	45	57	65	45	67	83	47	84	
12	Internet and E-Mail	87	83	87	38	69	45	73	43	
13										
14	<b>Total Marks</b>	565								
15										
16	<b>Average Mark</b>									
17										
18										

Red boxes highlight the following elements:

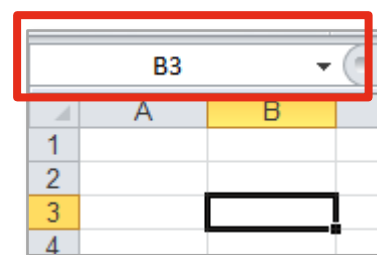
- Cell C14 (row 14, column C)
- Formula bar containing `=SUM(C5:C12)`
- Column C (Tom's marks)
- Cell D6 (Mark's mark for Word Processing)
- Cell G6 (Paul's mark for Word Processing)
- Row 16 (Average Mark row)
- Column J (Peter's marks)

**Task 2:** For more information on spreadsheets visit: [http://spreadsheets.about.com/od/excel101/u/20070929\\_basics\\_userpath.htm](http://spreadsheets.about.com/od/excel101/u/20070929_basics_userpath.htm) (use Ctrl + click on this link).

## 2. UNDERSTAND THE NAME BOX, FORMULA BAR AND AUTO FILL

### Name Box

The **name box** refers to the box above the column A, which shows the cell reference of the **active cell** (cell currently clicked on). In the example shown the cell reference B3 is shown in the name box.



The name box will also allow names to be assigned to a group of cells, for use in a formula or to allow the user to navigate quickly to that group of cells.

In this example the **range** C5:C12 has been highlighted and in the **name box** the word Tom has been typed. To assign the name 'Tom' to this range the **Enter key** on the keyboard *must* be pressed after typing the name.

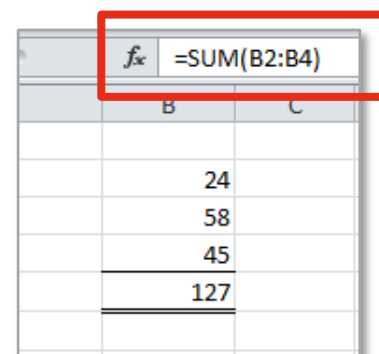
Named areas can be accessed from the drop-down arrow in the name box after they have been created.

A screenshot of an Excel spreadsheet. The Name Box at the top left shows 'Tom'. The formula bar shows '=75'. The spreadsheet has columns A, B, C, and D. Row 3 is the header for a table with columns 'Subject', 'Tom', and 'Mark'. Rows 5-12 contain data for various subjects. Row 14 shows 'Total Marks' as 565, and row 16 shows 'Average Mark'. The range C5:C12 is highlighted in blue.

	A	B	C	D
1				Compute
2				
3	Subject		Tom	Mark
4				
5	Spreadsheets		75	72
6	Word Processing		84	68
7	Text Production		64	53
8	Communications		79	77
9	Business Management		65	74
10	Web Authoring		66	62
11	Databases		45	57
12	Internet and E-Mail		87	83
13				
14	Total Marks		565	
15				
16	Average Mark			
17				
18				

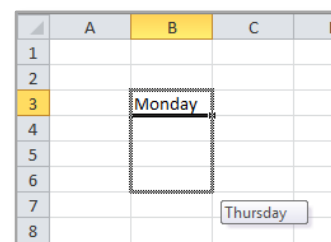
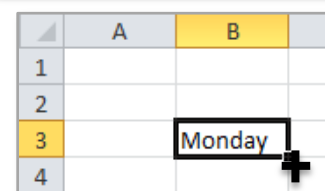
### Formula Bar

The **formula bar** is located above the spreadsheet column letters. In the formula bar the data or formula of the active cell (cell currently clicked on) is shown. From the formula bar it is possible to **insert** formula into a selected cell or **edit** the formula or data of the cell.



### Auto Fill

**Auto fill** is a tool in Excel that allows the user to automatically fill cells with data. There are pre-set **series** in Excel which are applied when the auto fill **handle** is dragged to other cells. To access auto-fill **series lists** hover the mouse cursor over the black square box in the right bottom corner of the active cell, click on the box and drag down or across to apply the series. The following example shows days of the week being auto-filled. Auto-fill can be applied to numbers, text, months, days and formula.



When auto fill is used in spreadsheet **formula** the following applies to any cell reference:

Dragging **Down** or **Up** will change the **Row** numbers.

Dragging **Across** to the left or the right will change the **Column** letters.

**Note** that auto fill can be applied to a whole column when dragging down a formula by double clicking on the auto fill box.

Additional **Series** include the following:

INITIAL SELECTION	EXTENDED SERIES
1, 2, 3	4, 5, 6,...
9:00	10:00, 11:00, 12:00,...
Mon	Tue, Wed, Thu,...
Monday	Tuesday, Wednesday, Thursday,...
Jan	Feb, Mar, Apr,...
Jan, Apr	Jul, Oct, Jan,...
Jan-07, Apr-07	Jul-07, Oct-07, Jan-08,...
15-Jan, 15-Apr	15-Jul, 15-Oct,...
2007, 2008	2009, 2010, 2011,...
1-Jan, 1-Mar	1-May, 1-Jul, 1-Sep,...
Qtr3 (or Q3 or Quarter3)	Qtr4, Qtr1, Qtr2,...
text1, textA	text2, textA, text3, textA,...
1st Period	2nd Period, 3rd Period,...
Product 1	Product 2, Product 3,...

NOTES:

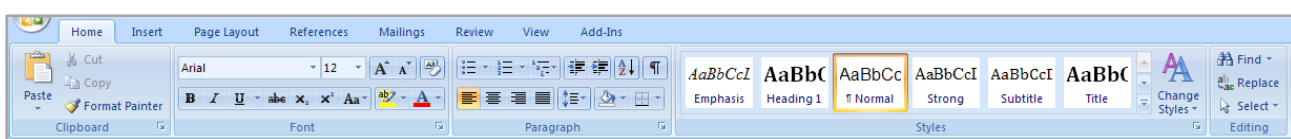
### 3. UNDERSTAND HOW TO ENTER NUMERIC, CHARACTER AND ALPHANUMERIC DATA

**Numeric Data** are Numbers for example 1, 2, 34 and 1885. To enter numeric data click on the cell where the information is to be added and type the numbers using the keyboard. It is recommended to use the **number keypad** to the right of the keyboard (if it is not working use the Num Lock button to turn the number keypad on).

**Character Data** are Letters, Numbers and Symbols - for example names, telephone numbers and any information that may need to be added to a spreadsheet.

To enter alphanumeric text in a cell click on the cell and type in the information using the keyboard.

To change the formatting of Character or Numeric data use the **'Home'** tool bar.



To edit the contents of a that has been entered, click on the cell and press the **F2 key**, this will allow the user to change the cell contents without deleting everything in the cell.

### 4. USE FORMULA TO GENERATE RESULTS USING BASIC FUNCTIONS

#### Formula Rules and Basic Functions

All formula must start with	=
To add something, use	+
To subtract something, use	-
To multiply something, use	*
To divide something, use	/

When writing formula **use the cell reference of the numbers** which will be used in the calculation, for example if the following two numbers are being added together:

1. First click into the cell the answer will be shown in.
2. Then start the formula with an =
3. Then click in (or type) the cell reference of the first cell.
4. Then type the symbol required - for example + - / \*
5. Then click in (or type) the final cell reference.
6. Finally press the enter key and the answer will show.

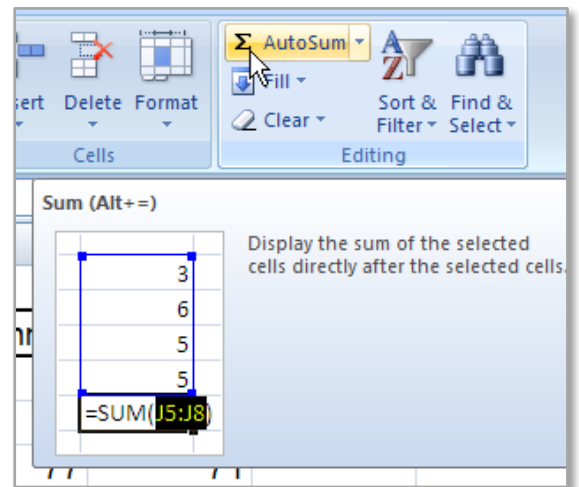
**NOTE:** Using the cell reference instead of the actual number values will mean the spreadsheet will automatically update if the numbers are changed later.

## Summation

Summation can be completed in Excel using the **SUM** formula.

The **SUM** formula is used to add **variables** (figures) together to get a total amount. There are two methods of using the SUM() formula:

1. The first is to use the auto sum button and highlight the correct area needed.
2. The second method is to type the formula into the selected cell as follows (using the correct cell reference). **=SUM(J5:J8)**



The cell references must go between the brackets. The first cell reference is listed then the colon and then the final cell reference is listed. This will automatically add every cell value between these two cells.

## Addition

To **add** two number in Excel use the + symbol (available to the right of the 9 and 6 on the number keypad). Start the formula with the = and enter the relevant cells as in the example shown.

	A	B	C
1			
2			
3		24	
4	Add	3	
5		=B3+B4	
6			

## Subtraction, Division & Multiplication

**Subtraction**, **division** and **multiplication** are all very similar to the previous example for **adding**. The only difference is that the symbol is changed as is required for example, the following shows how to divide two numbers in Excel.

To **divide** two numbers in Excel use the / forward slash symbol (available above the number 8 on the number keypad). Again start the formula with an = and select the relevant cell references.

	A	B	C
1			
2			
3		24	
4	Divide	3	
5		=B3/B4	
6			
7			

To **subtract** in Excel use the – symbol (available in the top right corner of the number keypad).

To **multiply** in Excel use the \* symbol (above the number 9 on the number keypad).

All of these **basic functions** / \* - + can be used in conjunction with each other and with Excel **functions**.



**NOTE:** Remember the **order of precedence** of calculation for a computer is as follows:

( )	Brackets First
*	Multiply
/	Divide
+	Add
-	Subtract

NOTES:

### 5. REPLICATE FORMULA OVER A RANGE OF CELLS USING RELATIVE CELL REFERENCES AND AUTO FILL

In **Task 3 Computer Studies Class Results** the formula in cell C14 can be replicated over the range of cells C14:J14. As mentioned on page 4 **Auto Fill** can be used to replicate a formula. When the formula has been entered into cell C14 use the auto fill in the bottom corner to drag the formula across to J14 - this will mean the formula only has to be entered once for this **row**.

10	Web Authoring		66	62	79	67	44	52	72	56
11	Databases		45	57	65	45	67	83	47	84
12	Internet and E-Mail		87	83	87	38	69	45	73	43
13										
14	Total Marks		565							
15										
16	Average Mark									
17										

**See auto fill  
(black square in bottom right of cell)**

By **dragging** the **Fill Handle**, you **copy and paste** the **formula** into other cells.

Authoring		66
bases		45
net and E-Mail		87
Total Marks		565
Average Mark		

**By dragging the  
fill handle, you can copy and paste  
the formula into other cells**

Total Marks		565								
-------------	--	-----	--	--	--	--	--	--	--	--

**What formula should have been generated in this cell?**

**REMEMBER: Change Formula**

To change formula click into the cell with the formula in it, then go to the formula bar at the top of the spreadsheet. Click into the formula and add or delete any required changes. Alternatively click on the cell and press the F2 button to edit the formula in the cell.

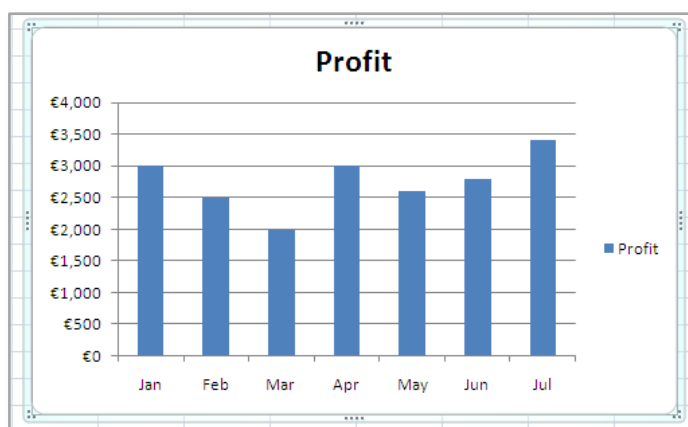
## 6. EXPLORE THE USES OF GRAPHS AND MACROS

### Graphs or Charts

Other common uses for spreadsheets are **Graphs**, graphs (or charts) are used to represent data. They are a visual representation of data in the spreadsheet. Some example graphs are show below (graphs are explained in detail in LO8). Graphs are created using the **Charts** group on the **Insert** toolbar.

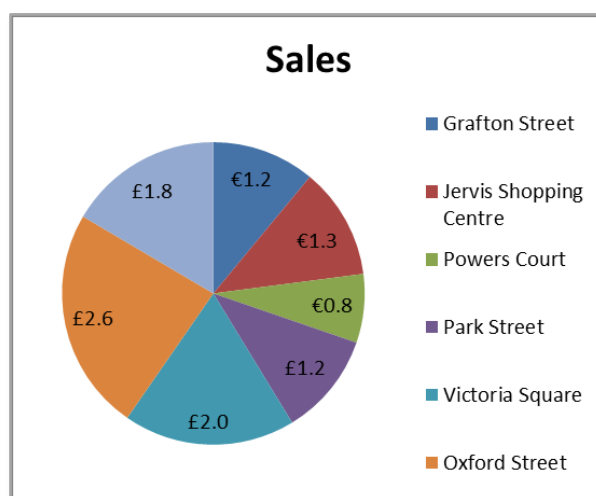
**Bar Chart** In the following example the profit of a snack shop for each month is shown in both data and in a bar chart. In the bar chart it is very easy to quickly see which month was most profitable and which was the least profitable.

	A	B	C
1	Month	Profit	
2	Jan	€3,000	
3	Feb	€2,500	
4	Mar	€2,000	
5	Apr	€3,000	
6	May	€2,600	
7	Jun	€2,800	
8	Jul	€3,400	
9			
10			



**Pie Chart** In this example the shoe sales for different outlets are shown in both data and a pie chart. It is very easy to quickly see that Oxford Street has the greatest share of the sales and that Powers Court has the least.

	A	B	C
1			
2	Shoe Shop Outlets		
3			
4	Shop Location	Sales	
5	Grafton Street	€1.2	
6	Jervis Shopping Centre	€1.3	
7	Powers Court	€0.8	
8	Park Street	£1.2	
9	Victoria Square	£2.0	
10	Oxford Street	£2.6	
11	Bond Street	£1.8	
12			
13			



Visually illustrating data in a chart means that the data can be quickly interpreted by the end user; this can be very useful in presentations and reports.

## Macros

An Excel macro is a set of instructions that can be triggered by a keyboard shortcut, toolbar button or an icon in a spreadsheet. Macros are used to eliminate the need to repeat the steps of common tasks over and over. Tasks such as adding or removing rows; protecting or unprotecting worksheets; selecting a range of cells, or adding the current date to a spreadsheet can all be completed using macros.

Macros will be investigated in this module in LO5, tasks will include recording macros, assigning them to objects and executing them.

### For additional information on any of the topics in this unit visit:

Ten Common Spreadsheet Terms -

[http://spreadsheets.about.com/od/excel101/tp/080726\\_ten\\_spreadsheet\\_terms.htm](http://spreadsheets.about.com/od/excel101/tp/080726_ten_spreadsheet_terms.htm)

**NOTES:**

**Task 1** Create a calculator that adds, subtracts, multiplies and divides.

1. Open an excel document and on the first worksheet, **Sheet 1** add values in a format similar to those shown in this image.

	A	B	C	D	E	F
1						
2		Calculator				
3						
4						
5	Add			Subtract		
6			7		5	
7			5		8	
8		12				
9						
10						
11	Multiply			Divide		
12			4		58	
13			78		2	
14						
15						

2. In the cells which will hold the answers create formula which use cell references to add, subtract, multiply and divide values.

3. Experiment with formatting; such as borders, fill colour, merging and bold text.

**Task 2** Create a Series of Auto Fill Series!

On the second worksheet, **Sheet 2** in the spreadsheet, using the **auto fill** tool create the following series:

1. Create a series using days of the week try the following in a cell each – Monday and Mon.
2. Try using months of the year using – January and Jan.
3. Create a series using numbers going up from 1 to 10.
4. Create a series of numbers moving up in multiples of 2 or 5.
5. Create a series using both numbers and words for example - Question 1.

	A	B	C	D	E
1					
2					
3		Monday	Mon	January	Jan
4		Tuesday			
5		Wednesday			
6		Thursday			
7		Friday			
8		Saturday			
9		Sunday			
10					
11					

### Task 3 An Excel exercise - Computer Studies Class Results

The following are the results for a computer studies class group.

1. Replicate the following spreadsheet on **Sheet 3** of the workbook; ensure the same **cell references**, cell alignment, shading, borders, etc. are used.
2. Enter the formula required in the grey cells.
3. Save the spreadsheet to your USB as '**LO2 Tasks Computer Studies Results**'.

	A	B	C	D	E	F	G	H	I	J
1	<b>Computer Studies Class Results</b>									
2										
3	<b>Subject</b>		<b>Tom</b>	<b>Mark</b>	<b>Jane</b>	<b>Mary</b>	<b>Paul</b>	<b>Rose</b>	<b>John</b>	<b>Peter</b>
4										
5	Spreadsheets		75	72	69	78	65	89	86	75
6	Word Processing		84	68	64	89	67	56	77	71
7	Text Production		64	53	49	67	78	75	56	56
8	Communications		79	77	54	61	84	59	67	60
9	Business Management		65	74	63	54	78	63	51	56
10	Web Authoring		66	62	79	67	44	52	72	56
11	Databases		78	57	65	45	67	83	47	84
12	Internet and E-Mail		87	83	87	38	69	45	73	43
13										
14	<b>Total Marks</b>									
15										
16	<b>Average Mark</b>									
17										