

# EXCEL REVISITED

1. Cell referencing (Mixed and absolute)
2. HLookup (Horizontal lookup)
3. VLookup (Vertical lookup)
4. IF conditions i.e If\*, If(And\*\*), If else\*\*\*\*, If(OR\*\*\*\*\*)

## 1. CELL REFERENCING

As simple as it seems, Excel cell reference confuses many students. How is a cell address defined in Excel? What is an absolute and relative reference and when each should be used? How to cross reference between different worksheets and files? In this REVISION, you will find answers to these and many more questions.

What is a cell reference in Excel?

A **cell reference**<sup>1</sup> or **cell address** is a combination of a column letter and a row number that identifies a cell on a worksheet.

Figure 01

	A	B
1		
2		
3		

For example, A1 refers to the cell at the intersection of column A and row 1; B2 refers to the second cell in column B, and so on.

When used in a formula, cell references help Excel find the values the formula should calculate.

For instance, to use the value of A1 to another cell, you use this simple formula: =A1.

To add up the values in cells A1 and A2, you use this one: =A1+A2 or =SUM(A1:A2)

### What is a range reference in Excel?

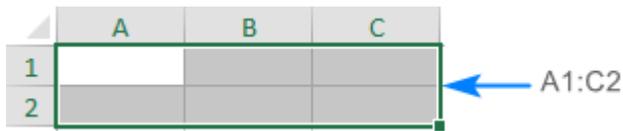
In Microsoft Excel, a range is a block of two or more cells. A **range reference** is represented by the address of the upper left cell and the lower right cell separated with a colon.

For example, the range A1:C2 includes 6 cells from A1 through C2.

---

<sup>1</sup> The word Reference comes from the word refer hence a cell reference is referring you to its address or cell address

Figure 02



## Excel reference styles

There exist two address styles in Excel: A1 and R1C1.

### A1 reference style in Excel

A1 is the default style used most of the time. In this style, columns are defined by letters and rows by numbers, i.e. A1 designates a cell in column A, row 1.

### R1C1 reference style in Excel

R1C1<sup>2</sup> is the style where both rows and columns are identified by numbers, i.e. R1C1 designates a cell in row 1, column 1.

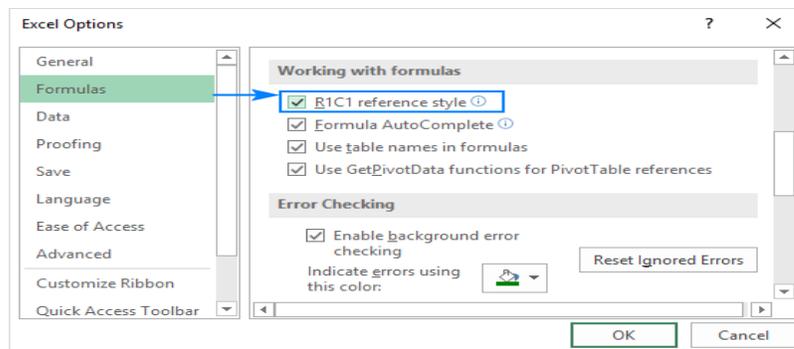
The below screenshot illustrates both the A1 and R1C1 reference styles:

Figure 03

	A1 reference style	R1C1 reference style																								
	<table border="1"><thead><tr><th></th><th>A</th><th>B</th></tr></thead><tbody><tr><th>1</th><td>A1</td><td>B1</td></tr><tr><th>2</th><td>A2</td><td>B2</td></tr><tr><th>3</th><td>A3</td><td>B3</td></tr></tbody></table>		A	B	1	A1	B1	2	A2	B2	3	A3	B3	<table border="1"><thead><tr><th></th><th>1</th><th>2</th></tr></thead><tbody><tr><th>1</th><td>R1C1</td><td>R1C2</td></tr><tr><th>2</th><td>R2C1</td><td>R2C2</td></tr><tr><th>3</th><td>R3C1</td><td>R3C2</td></tr></tbody></table>		1	2	1	R1C1	R1C2	2	R2C1	R2C2	3	R3C1	R3C2
	A	B																								
1	A1	B1																								
2	A2	B2																								
3	A3	B3																								
	1	2																								
1	R1C1	R1C2																								
2	R2C1	R2C2																								
3	R3C1	R3C2																								

To switch from the default A1 style to R1C1, click *File > Options > Formulas*, and then uncheck the **R1C1 reference style** box.

Figure 04



<sup>2</sup> R1C1 simply means Row 1 Column 1 hence the short form R1C1 and if the naming was to continue, then we would have R1C1,R2C2,R5C5 e.t.c e.t.c

## How to create a reference in Excel

To make a **cell reference** on the same sheet, this is what you need to do:

1. Click the cell in which you want to enter the formula.
2. Type the equal sign (=).
3. Do one of the following:
  - Type the reference directly in the cell or in the formula bar, or
  - Click the cell you want to refer to.
4. Type the rest of the formula and press the **Enter** key to complete it.

For example, to add up the values in cells A1 and A2, you type the equal sign, click A1, type the plus sign, click A2 and press **Enter**:

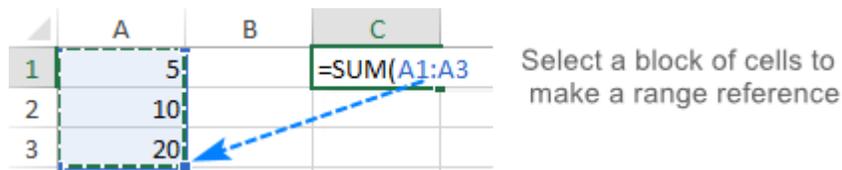
Figure 06



To create a **range reference**, select a range of cells on the worksheet.

For example, to add up the values in cells A1, A2 and A3, type the equal sign followed by the name of the SUM function and the opening parenthesis, select the cells from A1 through A3, type the closing parenthesis, and press **Enter**:

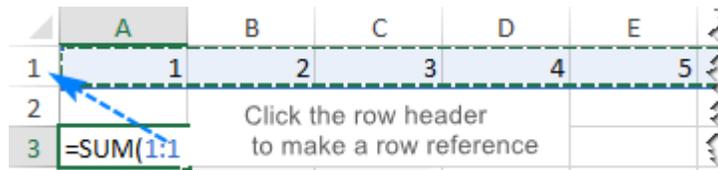
Figure 07



To refer to the **whole row** or **entire column**, click the row number or the column letter, respectively.

For instance, to add up all the cells in row 1, start typing the SUM function, and then click the header of the first row to include the **row reference** in your formula:

Figure 08



## How to change Excel cell reference in a formula

To change a cell address in an existing formula, carry out these steps:

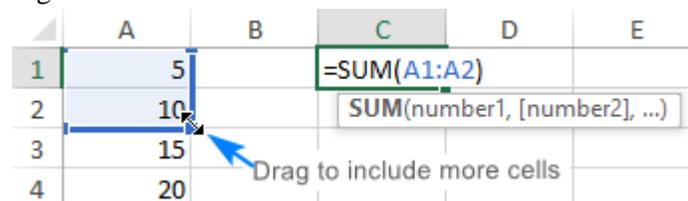
1. Click on the cell that contains the formula and press F2 to enter the Edit mode, or double-click the cell. This will highlight each cell/range referenced by the formula with a different color.
2. To change a cell address, do any of the following:
  - o Select the reference in the formula and type a new one.
  - o Select the reference in the formula, and then select another cell or range on the sheet.

Figure 09



- o To include more or fewer cells in a reference, drag the color-coded border of the cell or range.

Figure 10



3. Press the **Enter key**.

## How to cross reference in Excel

To refer to cells in another worksheet or a different Excel file, you must identify not only the target cell(s), but also the sheet and workbook where the cells are located. This can be done by using so-called **external cell reference**.

How to reference another sheet in Excel

To refer to a cell or a range of cells in another worksheet, type the name of the target worksheet followed by an exclamation point (!) before the cell or range address.

For example, here's how you can refer to cell A1 on Sheet2 in the same workbook:

**=Sheet2!A1**

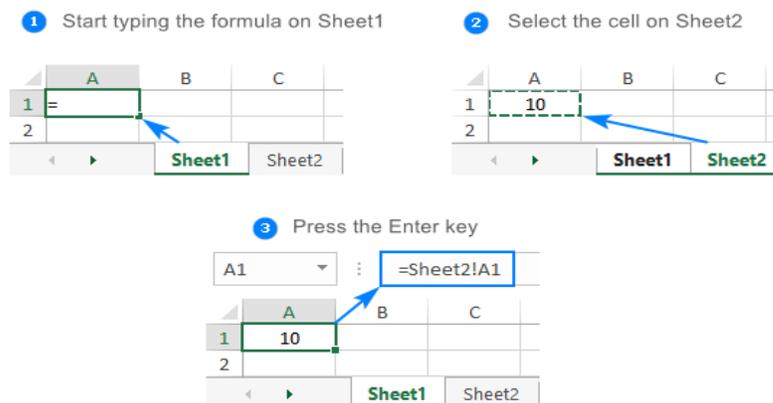
If the name of the worksheet contains spaces or non-alphabetical characters, you must enclose the name within single quotation marks, e.g.:

**= 'Target sheet'!A1**

To prevent possible typos and mistakes, you can get Excel to create an external reference for you automatically. Here's how:

1. Start typing a formula in a cell.
2. Click the sheet tab you want to cross-reference and select the cell or range of cells.
3. Finish typing your formula and press **Enter**.

Figure 11



## How to reference another workbook in Excel

To refer to a cell or range of cells in a different Excel file, you need to include the workbook name in square brackets, followed by the sheet name, exclamation point, and the cell or a range address. For example:

**= [Book1.xlsx]Sheet1!A1**

If the file or sheet name contains non-alphabetical characters, be sure to enclose the path in single quotation marks, e.g.

**= '[Target file.xlsx]Sheet1'!A1**

As with a reference to another sheet, you don't have to type the path manually. A faster way is to switch to the other workbook and select a cell or a range of cells there.

Relative, absolute and mixed cell references

There are three types of cell references in Excel: relative, absolute and mixed. When writing a formula for a single cell, you can go with any type. But if you intend to copy your formula to other cells, it is important that you use an appropriate address type because relative and absolute cell references behave differently when filled to other cells.

## Relative cell reference in Excel

A **relative reference** is the one without the \$ sign in the row and column coordinates, like A1 or A1:B10. By default, all cell addresses in Excel are relative.

When moved or copied across multiple cells, relative references change based on the relative position of rows and columns. So, if you want to repeat the same calculation across several columns or rows, you need to use relative cell references.

For example, to multiply numbers in column A by 5, you enter this formula in B2: **=A2\*5**. When copied from row 2 to row 3, the formula will change to **=A3\*5**.

Figure 12

	A	B	C
1	Data	Result	Formula
2	1	5	=A2*5
3	2	10	=A3*5
4	3	15	=A4*5

## Absolute cell reference in Excel

An **absolute reference** is the one with the dollar sign (\$) in the row or column coordinates, like \$A\$1 or \$A\$1:\$B\$10.

An absolute cell reference remains unchanged when filling other cells with the same formula. Absolute addresses are especially useful when you want to perform multiple calculations with a value in a specific cell or when you need to copy a formula to other cells without changing references.

For example, to multiply the numbers in column A by the number in B2, you input the following formula in row 2, and then copy the formula down the column by dragging the fill handle:

**=A2\*\$B\$2**

The relative reference (A2) will change based on a relative position of a row where the formula is copied, while the absolute reference (\$B\$2) will always be locked on the same cell:

Figure 13

	A	B	C	D
1	<b>Number</b>	<b>Multiply by</b>	<b>Result</b>	<b>Formula</b>
2	10	10	100	=A2*\$B\$2
3	20		200	=A3*\$B\$2
4	30		300	=A3*\$B\$2

## Mixed cell reference

A **mixed reference** contains one relative and one absolute coordinate, like \$A1 or A\$1.

There may be many situations when only one coordinate, column or row, should be fixed (doesn't move).

For example, to multiply a column of numbers (column A) by 3 different numbers (B2, C2 and D2), you put the following formula in B3, and then copy it down and to the right:

**=A3\*B\$2**

In \$A3, you lock the column coordinate because the formula should always multiply the original numbers in column A. The row coordinate is relative since it needs to change for other rows.

In B\$2, you lock the row coordinate to tell Excel always to pick the multiplier in row 2. The column coordinate is relative because the multipliers are in 3 different columns and the formula should adjust accordingly.

As the result, all the calculations are performed with a single formula, which changes properly for each row and column where it is copied:

Figure 14

	A	B	C	D
1	<b>Number</b>	<b>Multiply by</b>		
2		5	10	15
3	10	50	100	150
4	20	100	200	300
5	30	150	300	450

## How to switch between different reference types

To switch from a relative reference to absolute and vice versa, you can either type or delete the \$ sign manually, or use the F4 shortcut:

1. Double-click the cell that contains the formula.
2. Select the reference you want to change.

3. Press F4 to toggle between the four reference types.

Repeatedly hitting the F4 key switches the references in this order: A1 > \$A\$1 > A\$1 > \$A1.

Dear candidate practice with next practice pdf named “Practice cell referencing”

Send the work to either email for review with the subject “Please review my work [your name]” to [jnsereko22@gmail.com](mailto:jnsereko22@gmail.com) or [jnsereko22@icloud.com](mailto:jnsereko22@icloud.com)