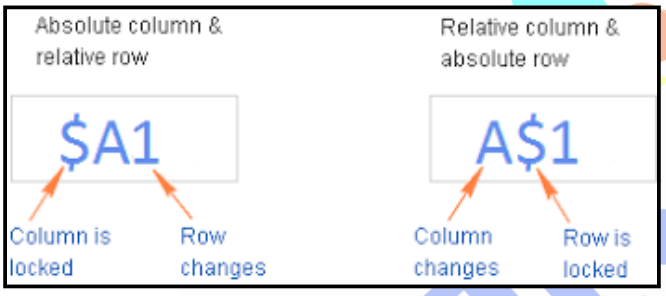
Microsoft Excel

Module 13 - Using Cell Referencing - Absolute, Relative and Mixed in MS Excel

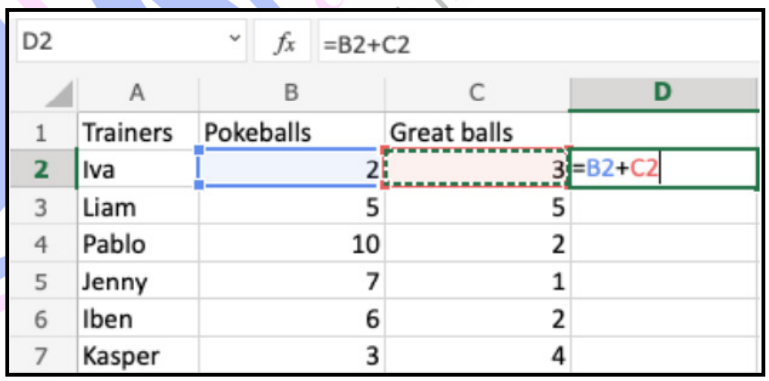
Cell referencing in MS Excel is used to refer to the value of a specific cell in formulas. It helps automate calculations by allowing formulas to be copied while maintaining the correct references. In **MS Excel**, cell referencing is used in formulas to refer to specific cells. There are three types of references:



1. Relative Reference:

Relative Reference updates automatically when copied to another cell. For example, if =A1+B1 is copied down, it changes to =A2+B2. It is useful when applying the same formula to multiple rows or columns. **Relative referencing is the default in Excel**, meaning unless $ is used, cell references will adjust automatically when copied.

- Changes when copied to another cell.
- Example: =A1 + B1
- If copied from **C1 to C2**, it changes to =A2 + B2.



Benefits of Relative Cell References:

- **Efficiency:** Relative references save time and effort because you don't need to manually adjust cell references when copying formulas.
- **Flexibility:** They allow you to create formulas that can be used on a range of data, adapting to the new context.
- **Dynamic Calculations:** When the values in the referenced cells change, the results of the formulas will automatically update

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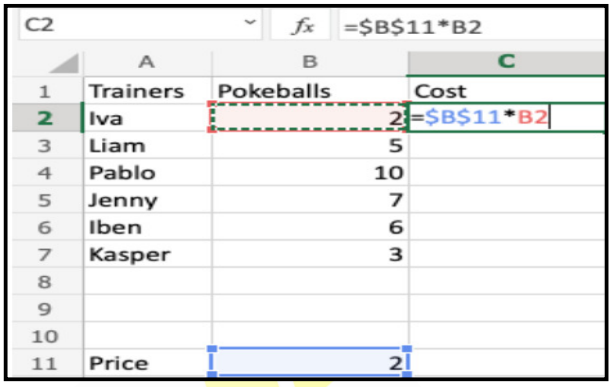
2. Absolute Reference ($A$1):

Absolute Reference remains constant, even when copied to another cell. It uses the $ symbol, such as =$A$1, ensuring that Excel always refers to the same cell. This is useful for fixed values like tax rates or conversion factors. Absolute and mixed references are useful in large datasets, where formulas need to reference specific values without changing when copied.



	A	B	C
1	Trainers	Pokeballs	Cost
2	Iva	2	=$B$11*B2
3	Liam	5	
4	Pablo	10	
5	Jenny	7	
6	Iben	6	
7	Kasper	3	
8			
9			
10			
11	Price	2	

To create an absolute cell reference in Excel, add a dollar sign ($) before both the column letter and the row number (e.g., $A$1). This ensures the reference remains constant when copying or filling formulas, while relative references adjust based on the new cell's position.

Here's a breakdown:
An absolute cell reference, like $A$1, always refers to the same cell, regardless of where the formula is copied or filled.

How to create one:

- Type the formula as usual, but add a dollar sign before the column letter and the row number of the cell you want to lock.
- For example, if you want to reference cell B2 absolutely, type $B$2.
- Example:
- If you have a formula =A1*B2 in cell C1, and you copy it to cell D2, the formula will change to =B2*C3 (relative reference).
- However, if you have a formula `=A1$B$2 in cell C1, and you copy it to cell D2, the formula will become `=B2`$B$2 (absolute reference).

Benefits of using absolute cell references:

- Maintain constant references: They ensure that a specific cell is always referenced, even when formulas are copied or filled.
- Simplify calculations: They can make complex calculations easier to manage, especially when multiple formulas need to reference the same cell.
- **Reduce errors: They help prevent errors that can occur when relative references change unexpectedly.**

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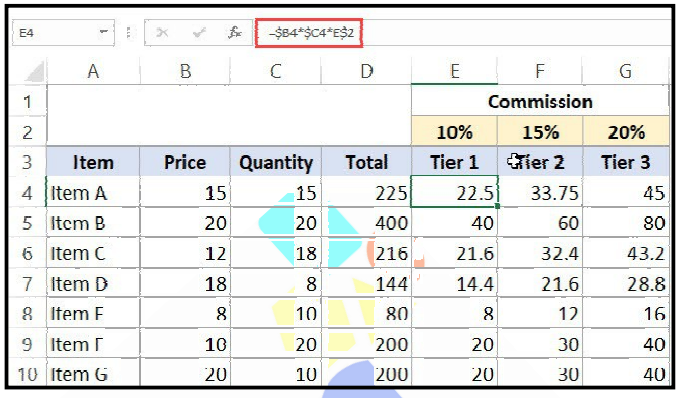
When to use absolute cell references:

- When you need to reference a cell that contains a constant value (e.g., a tax rate, an exchange rate, a formula constant).
- When you need to copy or fill formulas, and you want to ensure that certain cell references remain unchanged.



	A	B	C	D	E	F	G
1					Commission		
2					10%	15%	20%
3	Item	Price	Quantity	Total	Tier 1	Tier 2	Tier 3
4	Item A	15	15	225	22.5	33.75	45
5	Item B	20	20	400	40	60	80
6	Item C	12	18	216	21.6	32.4	43.2
7	Item D	18	8	144	14.4	21.6	28.8
8	Item F	8	10	80	8	12	16
9	Item F	10	20	200	20	30	40
10	Item G	20	10	200	20	30	40

3. Mixed Reference ($A1 or A$1):

Mixed Reference locks either the row or the column. $A1 keeps **column a fixed** while allowing the row to change. A$1 keeps **row 1 fixed** while allowing the column to change. This is useful in structured calculations like multiplication tables.

How to create a mixed cell reference:

- Select a cell where you want to create a mixed reference
- Enter an equal sign (=) in the formula
- Select the point of reference
- Add a dollar sign ($) before the column letter to create an absolute column
- Add a dollar sign ($) before the row number to create an absolute row

Benefits of mixed cell references:

- They are versatile and convenient
- They are frequently used in Excel spreadsheets
- They are particularly preferred when doing calculations in Excel

Uses or Purpose of Cell References in MS Excel:

1. **Automating Calculations** - Cell references allow formulas to be copied across multiple cells, reducing manual work. For example, summing different rows using =A1+B1 without rewriting the formula.
2. **Creating Dynamic Formulas** - When data changes in referenced cells, formulas update automatically without needing manual adjustments.
3. **Handling Large Datasets** - In financial models, sales reports, and statistical analysis, cell references make it easier to apply calculations across many rows and columns.
4. **Reducing Errors** - Absolute references ($A$1) ensure fixed values, preventing mistakes in calculations like tax rates, interest rates, or fixed multipliers.

5. **Efficient Data Analysis** – Mixed references (`$A1` or `A$1`) help in structured calculations such as multiplication tables, currency conversions, and percentage distributions.
6. **Simplifying Formula Copying** – Instead of entering a formula in every cell, references allow users to copy and apply formulas quickly across a range of cells.
7. **Enabling Conditional Formatting** – References are useful in rules for highlighting cells based on specific conditions, such as marking values greater than a certain threshold.
8. **Supporting Chart and Report Creation** – References allow dynamic linking of data to charts, pivot tables, and dashboards, ensuring updates are reflected automatically.

Cell references make Excel more powerful by ensuring formulas are flexible, accurate, and easy to manage.

Assignment

Enter the dataset in MS Excel and apply the formulas given in the table and perform the given tasks:

- **Copy the formula from C2 to C6** and observe how the relative reference updates.
- **Copy the formula from E2 to E6** and check if the absolute reference remains fixed.
- **Copy the formula from F2 to F6** and verify how the mixed reference works.

Product	Price per Unit (A)	Quantity (B)	Total Price (Relative)	Discount (Absolute)	Final Price (Mixed)
Apple	50	2	`=A2*B2`	`=$D$1` (10%)	`=C2-(C2*$D$1)`
Banana	30	5	`=A3*B3`	`=$D$1` (10%)	`=C3-(C3*$D$1)`
Mango	80	3	`=A4*B4`	`=$D$1` (10%)	`=C4-(C4*$D$1)`
Orange	40	4	`=A5*B5`	`=$D$1` (10%)	`=C5-(C5*$D$1)`
Grapes	60	1	`=A6*B6`	`=$D$1` (10%)	`=C6-(C6*$D$1)`