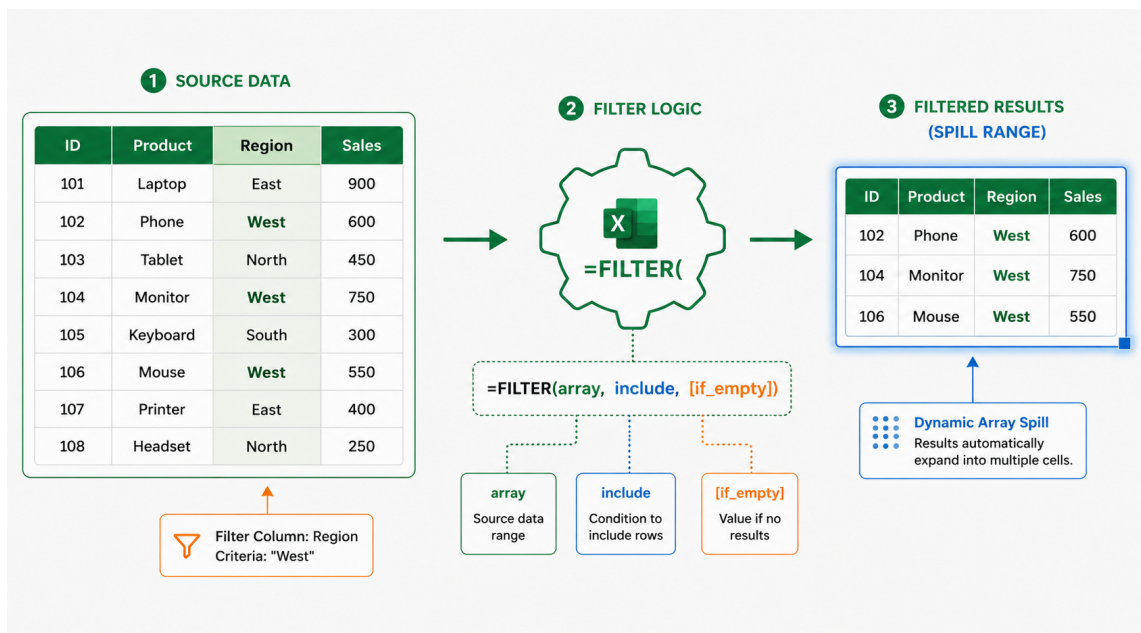


Advanced Excel & Google Sheets Cheat Sheet

A printable guide to advanced lookups, dynamic arrays, conditional analysis, data cleaning, PivotTables, QUERY, and faster spreadsheet workflows.



Advanced lookups and references

Return exact matches, handle missing values, and build formulas that remain stable as tables grow.

01 - LOOKUP TOOLKIT

Choose the right lookup pattern

PATTERN	BEST USE	FORMULA
XLOOKUP	Exact lookup in any direction	=XLOOKUP(E2,A2:A100,C2:C100,"Missing")
INDEX + MATCH	Compatible flexible lookup	=INDEX(C2:C100,MATCH(E2,A2:A100,0))
XMATCH	Returns a match position	=XMATCH(E2,A2:A100,0)
Two criteria	Match combined conditions	=XLOOKUP(H2&I2,A2:A100&B2:B100,D2:D100)
Last match	Return the latest matching row	=XLOOKUP(E2,A2:A100,C2:C100,"",0,-1)

02 - REFERENCE TOOLS

Select rows and columns dynamically

FUNCTION	BEST USE	FORMULA
CHOOSECOLS	Return selected columns	=CHOOSECOLS(A2:F100,1,3,6)
TAKE	Return first or last rows	=TAKE(A2:F100,-10)
DROP	Exclude header or leading rows	=DROP(A1:F100,1)
INDIRECT	Build a reference from text	=INDIRECT("Sales!B"&A2)

TIP

Use structured table references when possible. They are easier to audit and expand automatically. Avoid excessive INDIRECT because it is volatile and can slow large workbooks.

Dynamic arrays and filtering

Write one formula that spills into neighboring cells, then combine array functions to create reusable analysis views.

03 - DYNAMIC ARRAY FUNCTIONS

Filter, sort, and reshape results

FUNCTION	RESULT	EXAMPLE
FILTER	Return rows meeting a condition	=FILTER(A2:D100, C2:C100="Europe", "None")
UNIQUE	Create a distinct list	=UNIQUE(B2:B500)
SORT	Sort a returned array	=SORT(A2:D100, 4, -1)
SORTBY	Sort by another range	=SORTBY(A2:D100, D2:D100, -1)
SEQUENCE	Generate sequential values	=SEQUENCE(12, 1, 1, 1)
TOCOL	Stack a range into one column	=TOCOL(B2:D20, 1)

04 - ARRAY PATTERNS

Combine functions for practical views

GOAL	FORMULA
Top 10 open items	=TAKE(SORT(FILTER(A2:E200, E2:E200="Open"), 4, -1), 10)
Sorted unique list	=SORT(UNIQUE(B2:B500))
Multiple conditions	=FILTER(A2:D100, (B2:B100="East")*(D2:D100>=500))
OR conditions	=FILTER(A2:D100, (B2:B100="East")+(B2:B100="West"))

CHECK

A #SPILL! error means cells in the output area are blocked. Clear the spill range, and do not place dynamic array formulas inside legacy Excel Tables.

Conditional totals, logic, and reusable formulas

Summarize data with multiple criteria and make complex formulas easier to read, test, and maintain.

Calculate only matching records

FUNCTION	USE	EXAMPLE
SUMIFS	Sum with several criteria	=SUMIFS(D:D,A:A,"East",C:C,">="&F2)
COUNTIFS	Count matching rows	=COUNTIFS(A:A,"East",B:B,"Open")
AVERAGEIFS	Average matching values	=AVERAGEIFS(D:D,A:A,"East",D:D,">0")
SUMPRODUCT	Weighted or array calculation	=SUMPRODUCT(B2:B100,C2:C100)/SUM(C2:C100)
IFS	Evaluate conditions in order	=IFS(B2>=90,"A",B2>=80,"B",TRUE,"C")

Make long formulas easier to manage

TOOL	PURPOSE	EXAMPLE
LET	Name repeated calculations	=LET(net,B2-C2,tax,net*\$F\$1,net-tax)
LAMBDA	Create a reusable custom function	=LAMBDA(price,rate,price*(1-rate))(B2,C2)
IFERROR	Provide a controlled fallback	=IFERROR(XLOOKUP(A2,IDs,Prices),"Check ID")
Named ranges	Replace cryptic references	=SUMIFS(Sales,Region,H2,Status,"Open")

TIP

Evaluate complex formulas in small pieces. In Excel, use Formulas > Evaluate Formula; in Google Sheets, select a formula segment in the formula bar to inspect its result.

Text, dates, and inconsistent source data

Standardize imported values before analysis so lookups, PivotTables, and charts return trustworthy results.

07 - TEXT TRANSFORMATION

Split, extract, combine, and normalize

FUNCTION	USE	EXAMPLE
TEXTSPLIT	Split text by delimiters	=TEXTSPLIT(A2, ", ", " ")
TEXTBEFORE	Return text before a marker	=TEXTBEFORE(A2, " - ")
TEXTAFTER	Return text after a marker	=TEXTAFTER(A2, " - ")
TEXTJOIN	Combine values with a delimiter	=TEXTJOIN(", ", TRUE, B2:D2)
TRIM + CLEAN	Remove spaces and hidden characters	=TRIM(CLEAN(A2))
SUBSTITUTE	Replace matching text	=SUBSTITUTE(A2, "N/A", "")

08 - DATE ANALYSIS

Create reporting periods and working-day logic

PATTERN	PURPOSE	EXAMPLE
EOMONTH	Month-end date	=EOMONTH(A2,0)
WORKDAY	Move by working days	=WORKDAY(A2,10,Holidays)
NETWORKDAYS	Count working days	=NETWORKDAYS(A2,B2,Holidays)
Quarter label	Group dates by quarter	="Q"&ROUNDUP(MONTH(A2)/3,0)&" "&YEAR(A2)
Month bucket	First date of month	=EOMONTH(A2,-1)+1

DATA

Numbers stored as text often break totals and matches. Check alignment, use VALUE when appropriate, and confirm that imported dates are real serial dates rather than display text.

PivotTables, QUERY, and dashboard workflows

Choose the right analysis layer for fast summaries, interactive reports, and repeatable refreshes.

From raw records to decision-ready summaries

TOOL	BEST USE	GOOD PRACTICE
Excel Table	Structured source with auto-expanding ranges	One header row; no blank records
PivotTable	Group and aggregate large datasets quickly	Refresh after source changes
Slicer	Interactive filtering for tables and pivots	Use for status, region, or owner
Power Query	Import, clean, merge, and refresh data	Prefer repeatable steps over manual edits
PivotChart	Visualize a PivotTable summary	Keep labels and series limited

Cloud-native analysis and automation

SHEETS TOOL	USE	EXAMPLE
QUERY	SQL-style filter, group, and sort	<code>=QUERY(A1:E100,"select A,sum(E) group by A",1)</code>
ARRAYFORMULA	Apply logic to an entire column	<code>=ARRAYFORMULA(IF(A2:A="", "", B2:B*C2:C))</code>
IMPORTRANGE	Pull a range from another file	<code>=IMPORTRANGE(url,"Sales!A1:G500")</code>
SPARKLINE	Create an in-cell mini chart	<code>=SPARKLINE(B2:M2)</code>

COMPATIBILITYExcel and Google Sheets share many functions, but syntax and availability differ. Test modern functions in the target platform before distributing a workbook.

Errors, performance, and a safer advanced workflow

Diagnose broken models, reduce unnecessary recalculation, and continue with the full interactive reference online.

11 - ADVANCED ERROR GUIDE

Find the cause before hiding the symptom

ISSUE	TYPICAL CAUSE	WHAT TO CHECK
#N/A	Lookup value not found	Normalize spaces and data types; verify match mode
#SPILL!	Array output is blocked	Clear the output range or move the formula
#CALC!	Array calculation cannot return a valid result	Check empty FILTER results and nested arrays
#REF!	A deleted or invalid reference	Trace precedents and restore the source range
Circular reference	Formula depends on itself	Use error checking and redesign the dependency

12 - PERFORMANCE CHECKLIST

Keep large workbooks responsive

PRACTICE	WHY IT HELPS
Use bounded ranges	Prefer A2:A50000 over full-column array calculations when practical.
Reduce volatile functions	Limit OFFSET, INDIRECT, NOW, TODAY, and RAND in large models.
Calculate once	Use LET or helper columns instead of repeating expensive expressions.
Flatten finished outputs	Paste values for archived results that no longer need live formulas.
Separate layers	Keep raw data, transformation, calculations, and reporting on distinct sheets.

Continue with the interactive guide

Open the complete Advanced Excel & Google Sheets guide for expanded explanations, examples, and official learning resources.

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