

Excel – Focus on Formulas

Overcome "formula phobia" and make MS Excel do what YOU want it to do! See formulas explained from the ground up, with technical terms translated into simple language. You'll also see how to build more powerful, complex formulas...one step at a time.

Basic Formulas and Functions

1. A formula always begins with an equal sign and can be composed of many items:

= 3 + 4 + 5 adds these numbers; the cell displays 12

= 20 / 2 * 3 twenty divided by 2 (10) times 3; cell displays 30

What if we wanted to first multiply 2 by 3, then divide 20 by 6?

2. Order of (mathematical) operations: PEMDAS Please Excuse My Dear Aunt Sally

Parentheses (), Exponents ^

Multiplication and Division * / as they occur from left to right

Addition and Subtraction + - as they occur from left to right

3. A function is an automatic formula.

Hundreds of functions are built into Excel; you can also create your own functions.

Functions also begin with an *equal sign*, then the *function name* followed by *parentheses*.

The parentheses contain the "stuff" the function needs to do its job.

Examples: (note the comma separators)

=sum(1,3,5) result: 9

=average(3*4,13,2*7) result: 13

BUT we always use cell REFERENCES instead of typing numbers in the formula

=sum(C1, F7) result: add contents of 2 cells

=sum(C1:F7) result: add contents of 28 cells

colon indicates continuous range

4. Never type a number if you can use a formula based on another number(s):

Gross pay = Hours * HourlyRate

Date next week = TODAY() + 7

First Initial = LEFT(FirstName,1)

5. Once you create a formula, retyping it is unnecessary

Copy and Paste or

Ctrl + Drag-and-Drop or

Use the Fill Series feature – drag fill box, lower-right corner of range (mouse pointer = tiny black cross without arrows); double-click to match length of previous or next column

Other Helpful Basics

6. Do not type cell references; simply select the cell(s) you wish to use
7. To show formulas in cells instead of results, choose
Formulas tab, Formula Auditing group, Show Formulas
Ctrl + ` (grave accent, below Esc key) = toggles between formulas and results
8. Relative reference (default): cell reference changes when copied, relative to movement (D4)
Absolute reference: cell reference does not change when copied (\$D\$4)
Formula in edit mode; cursor touching reference(s); press F4 to cycle among 4 possible modes:
relative(D4), absolute(\$D\$4), mixed1(D\$4), mixed2 (\$D4)
9. Insert Function button (left of formula bar) gives list of all functions in Excel
Choose by category
Wizard walks you through
Get help on any aspect of the function from within the wizard

Decision-Making Functions (now *that's* power!)

10. IF function needs 3 parameters (things to do its job)

A: a condition that evaluates to True or False

B: result if condition is True

C: result if condition is False

=IF(A, B, C) means If A is true, give me B; otherwise, give me C
=IF(G5>1000, "Big", "Little")

A programmer would say it this way:
If A, then B, else C

To give a 15% commission on sales (in cell G5) over \$1,000 and
an 8% commission on sales up to \$1,000, use a formula like this:

=IF(G5>1000, G5*0.15, G5*0.08)

11. LOOKUP functions allow you to search a table, find a match,
and return its corresponding value in a subsequent column or row

VLOOKUP (vertical lookup) searches for a match in the first column

HLOOKUP (horizontal lookup) searches for a match in the first row

	A	B	C	D	E	F	G
1	Score	Grade					
2	-10	F					
3	59.5	D					
4	69.5	C	Name	Avg	Formula	Result	
5	79.5	B	Wesley	45	=VLOOKUP(D5,\$A\$2:\$B\$6,2)	F	
6	89.5	A	Suzanna	98	=VLOOKUP(D6,\$A\$2:\$B\$6,2)	A	
7			Vicinni	79	=VLOOKUP(D7,\$A\$2:\$B\$6,2)	C	
8			Buttercup	80	=VLOOKUP(D8,\$A\$2:\$B\$6,2)	B	

More Helpful Tips

12. Many spreadsheet users place summary calculations in upper left area:

- Saves scrolling in large worksheets
- Print 1st page only for summary information
- Ctrl + Home will access calculation area

13. Formulas referring to cells on other worksheets/workbooks (3-Dimensional Formulas):

- Start formula as usual, navigate to any cell(s) on other worksheets and/or workbooks
- Press Enter when finished to complete the formula and return to original cell

14. Advanced formula construction

- Nested functions: build one step at a time, then put together
- Example: Separate FullName in one cell into FirstName, LastName in two different cells

15. & (ampersand) is used to link things together into one long string of characters (concatenate)

=NOW() is the formula for the current date and time

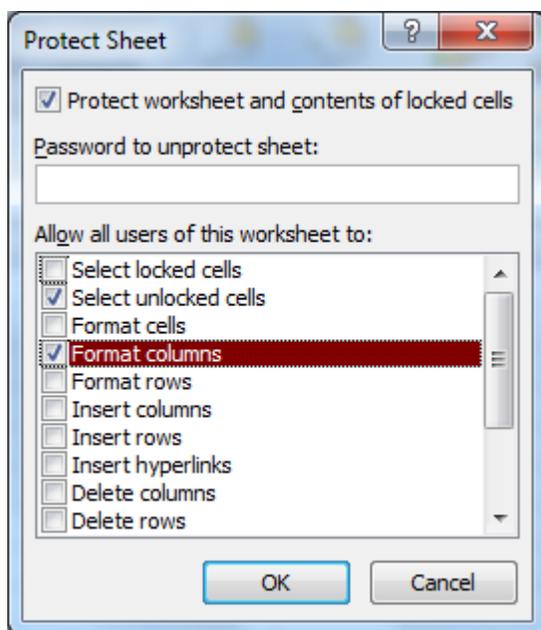
Ctrl + ; (semicolon) = current date

Ctrl + : (colon) = current time

Ctrl + ' (apostrophe) = copy entry from cell above (think "ditto" marks)

16. To protect selected cells, you must first "install locks" by choosing Home, Format, Format Cells (Ctrl + 1), Protection tab, checkbox Locked (indicated by check mark, NOT solid color)

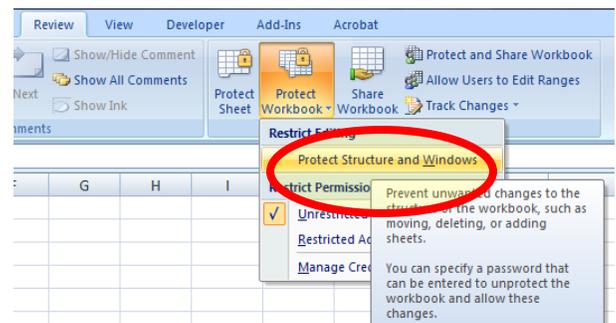
17. Then to "shut" the locks, choose Review, Protect Sheet. Check or uncheck various options as you desire (my preferences are shown here): password is optional; always save an unprotected copy.



18. Can a user delete a protected worksheet?

Yes! (unless the workbook is also protected).

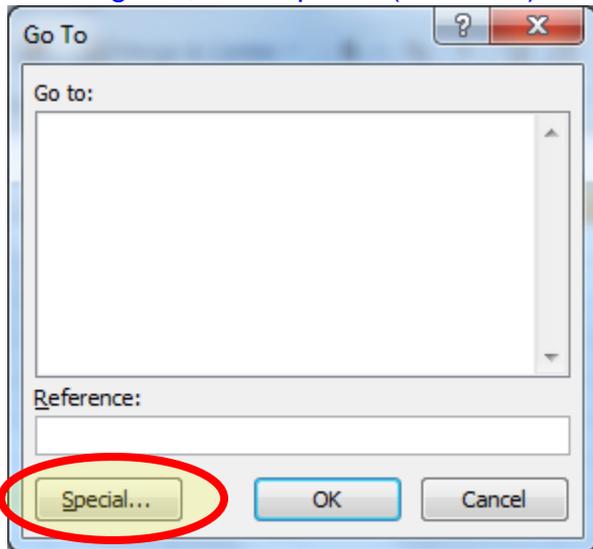
To do this, Choose Review,
Protect Workbook,
Protect Structure and Windows



19. To easily select all formulas (to protect those cells, for example):

Home tab, **Editing** group, **Find & Select**, and then click **Go To**. (Ctrl + G)

In dialog box, click Special (lower left)



In dialog box, choose Formulas, then OK.

