CUSTOM FORMATTING

All tables and charts used in this article can be downloaded from
http://www.chartrecipes.com/article-custom-formatting.html

NUMBER FORMATTING IN EXCEL

Number formatting refers to the way Excel displays numbers and certain text in the worksheet. The same number can appear differently according to the number formatting applied to the cell. For example, you can display one thousand (1,000) as $1,000.00 or 1,000.00 or 1,000 or 1.

	A	B
1	Number Entered	Excel Formatting
2	1000	$1,000.00
3	1000	1,000.00
4	1000	1,000
5	1000	1

The value in the cell stays the same but its appearance changes. Number formatting is one of the many attributes that each cell carries. Number formatting options can be found on the **Number** tab of the **Format Cells** dialog box.
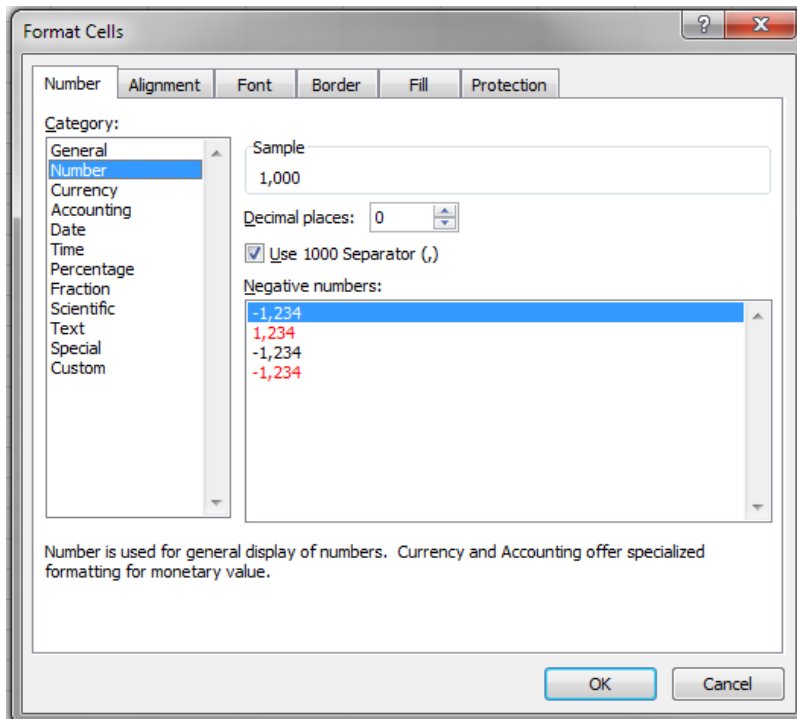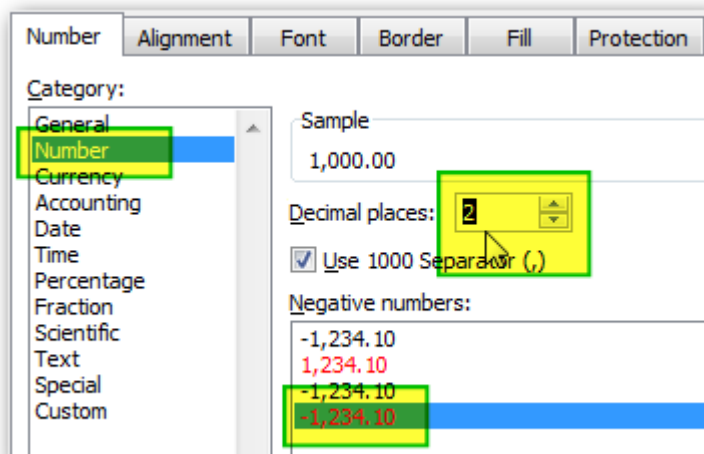
To open the **Format Cells** dialog box click the Dialog Box Launcher on the Number section of the Ribbon.
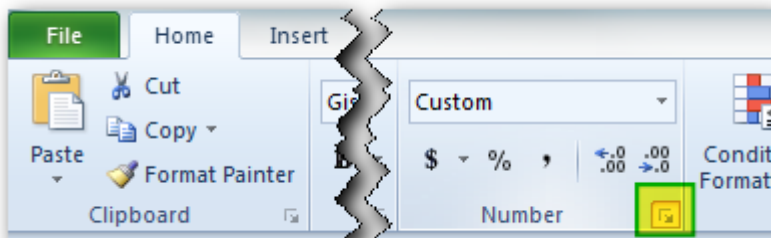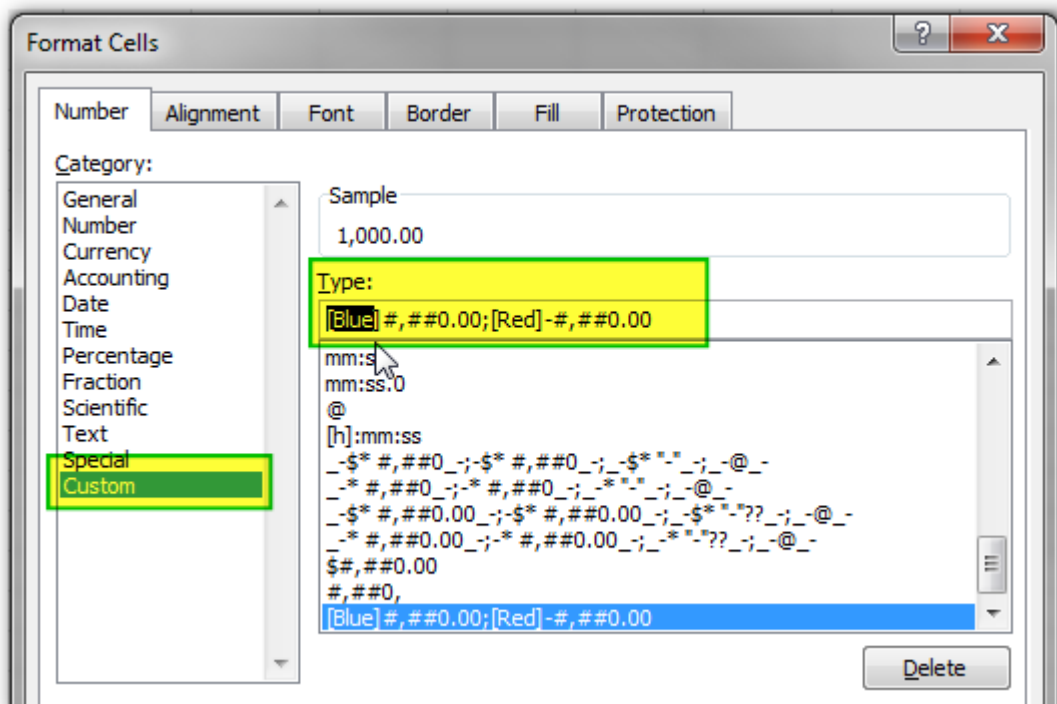
How to change number formatting

You can change number formatting in Excel by selecting formatting options on the **Numbers** tab...

... or by creating custom formatting code in the **Custom** number category.

Below is an example of how to make positive numbers appear in blue.

	A	B	C
1	Number Entered	Excel Formatting	Format Code
2	1000	$1,000.00	$#,##0.00
3	1000	1,000.00	#,##0.00
4	1000	1,000	#,##0
5	1000	1	#,##0,

CUSTOM NUMBER FORMATTING – CODE SYNTAX

CODE BASICS

Custom number formats are created by entering sections of code into the **Type** entry field.
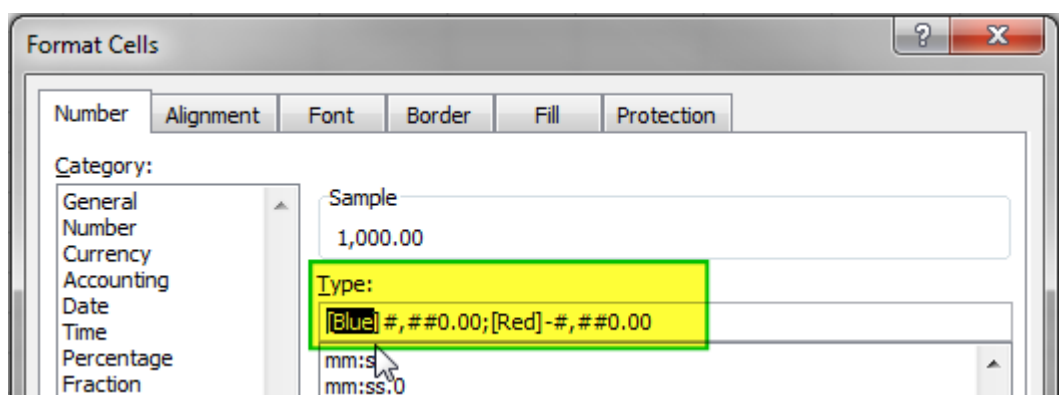
You can enter up to four sections of code.

The sections are:

POSITIVE ; NEGATIVE ; ZERO ; TEXT .

A semicolon is used to separate the sections.

Each section of code controls the formatting of:

POSITIVE – positive numbers
NEGATIVE – negative numbers
ZERO – zero
TEXT – this section is used to specify text that you want to appear next to the text which you enter into a cell.

CODE RULES

You can enter one, or two, or three, or all four code sections. However, the number of sections you enter changes what each section means to Excel.

These are the rules of how Excel interprets the custom formatting code based on the number of code sections you enter:

- You enter one section, the same format is applied to all numbers.
- You enter two code sections, the first section formats positive numbers and zeroes, and the second section formats negative numbers.
- You enter three code sections, the first section is applied to positive numbers, the second section is applied to negative numbers and the third section is applied to zeroes.

| Number of code sections	CODE	Positive numbers	Negative numbers	Zero	Text
You enter one code section	#,##0.00	1,000.00	-1,000.00	0.00	Awesome
You enter two code sections	#,##0;**[Red]-#,##0**	1,000	-1,000	0	Awesome
You enter three code sections	$#,##0;**[Red]$-#,##0;**$0.000	$1,000	$-1,000	$0.000	Awesome
You enter four code sections	$#,##0.0;**[Red]$-#,##0.0;**$0.000;"code "@	$1,000.0	$-1,000.0	$0.000	code Awesome

- You can skip a section by entering a semicolon only. Numbers will not be displayed if only semicolons are entered in the first three fields. For example, if you want to specify formatting for zeroes and add a phrase that would appear next to each text entry, you need to have all four sections according to the rules above. The example is illustrated in the table below:

Number of code sections	CODE	Positive numbers	Negative numbers	Zero	Text
You enter four code sections	;;$0.000;"The user entered: "@			$0.000	The user entered: some text

Notice that although a value of "1000" was entered into the "Positive numbers" and "Negative numbers" columns in Excel, the values do not appear. That is because there is no formatting code for positive or negative numbers.

- Text which you enter in the TEXT code section will be displayed only if you enter "@" at the end of the section. The text must have double quotes on either side.
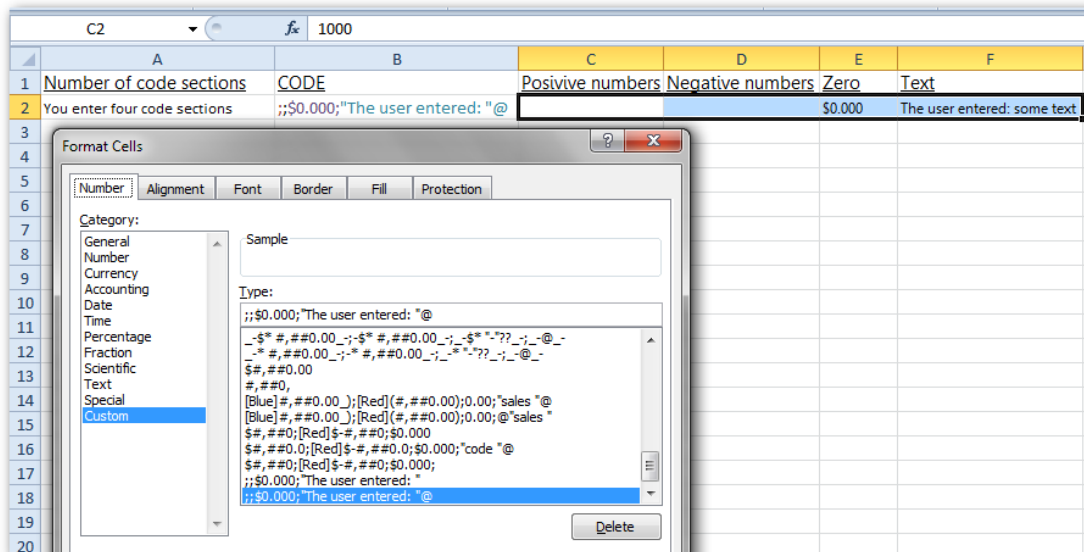
- FOR NUMBERS, EACH CODE SECTION, EXCEPT FOR TEXT ,SHOULD HAVE FORMATTING SYMBOLS IN THE FOLLOWING ORDER: COLOUR, CURRENCY, COMMA SEPARATOR, DECIMAL PLACES AND TEXT. FOR EXAMPLE, [GREEN]$#,##0.000" DOLLARS".

CUSTOM NUMBER FORMATTING – CODE GRAMMAR

The custom formatting code consists of a range of symbols. Each symbol has its own formatting properties and can be combined with other symbols.

DECIMAL PLACES

It is important to know how to format decimal places because Excel will either round the number up or display "#####" in the cell if the number you enter is longer than the width of a column.

There are four symbols which are used for formatting decimal places:

1. **. (period)** – A period in the code displays the decimal point. Decimals will not be displayed if there is no period in the formatting code.

	Number formatting		
Number entered	0	.00	0.000
1	1	1.00	1.000
5	5	5.00	5.000

2. **0 (zero)** – A zero symbol shows as many digits in the fractional part ([mantissa](#)) as there are zeroes in the formatting code after the decimal.

Number entered	Number formatting		
	0	.00	0.000
1	1	1.00	1.000
5	5	5.00	5.000
100	100	100.00	100.000
500	500	500.00	500.000
1000	1000	1000.00	1000.000
50000	50000	50000.00	50000.000
1000000	1000000	1000000.00	1000000.000
50000000.0002	50000000	50000000.00	50000000.000

Notice that when 50000000.0002 is entered into a cell formatted as "0.000", only three decimal places are displayed and the number is rounded down. When 1 is entered into a cell formatted as "0.00", Excel will display "1.00" even though the user did not enter any decimal places.

3. **# (hash)** – This digit placeholder shows only as many digits in the fractional part as there are "#" symbols in the formatting code after the decimal point. But this code does not show insignificant zeroes.

Number entered	Number formatting				
	#	.##	#.###	#.####	#.#####
1.1	1	1.1	1.1	1.1	1.1
5	5	5.	5.	5.	5.
100.01	100	100.01	100.01	100.01	100.01
500	500	500.	500.	500.	500.
1000.05	1000	1000.05	1000.05	1000.05	1000.05
50000	50000	50000.	50000.	50000.	50000.
1000000.0001	1000000	1000000.	1000000.	1000000.0001	1000000.0001
50000000.00002	50000000	50000000.	50000000.	50000000.	50000000.00002

Notice that when 50000000.00002 is formatted as "#.#####" (five digits in the mantissa) then all the decimal places are displayed. However, when the same number is formatted as "#.####" (four digits in the mantissa) then Excel displays only 50000000. That happens because the "#.####" format allows only four decimal places to be displayed and the fifth digit "2" is rounded down to zero "50000000.0000". Because the # (hash) symbol does not display insignificant zeroes, the number is displayed as "50000000.".

4. **? (question mark)** – The question mark is similar to the "0" (zero) format but instead of displaying insignificant zeroes, this format adds spaces in both the

integer-part and the fractional-part of the number. This format can be used to visually align numbers in a column by the decimal point.

Number entered	Number formatting				
	?	??.??	???.???	??????????.?	?.????????
1.1	1	1.1	1.1	1.1	1.1
5.2	5	5.2	5.2	5.2	5.2
100.123	100	100.12	100.123	100.1	100.123
500.8888	501	500.89	500.889	500.9	500.8888
1000.12345	1000	1000.12	1000.123	1000.1	1000.12345
50000.12346	50000	50000.12	50000.123	50000.1	50000.123456
1000000.1234567	1000000	1000000.12	1000000.123	1000000.1	1000000.1234567
49999999.7654321	50000000	49999999.77	49999999.765	49999999.8	49999999.7654321

PERCENTAGES

% (percent sign) – The percent sign is used to display fractions as percentages.

Number entered	Number formatting			
	0%	0.00%	0.00%*!	???????.00%
1/4	25%	25.00%	25.00%!!!!	25.00%
2.25	225%	225.00%	225.00%!!!	225.00%
0.10	10%	10.00%	10.00%!!!!	10.00%

A THOUSANDS SEPARATOR

, (comma) – The comma is used as a thousands separator or to scale a number by a thousand.

Number entered	Number formatting					
	#,###	#,###,	#,#??	#,#??,	#,##0.00	#,##0.00,
1000	1,000	1	1,000	1	1,000.00	1.00
10000	10,000	10	10,000	10	10,000.00	10.00
500000	500,000	500	500,000	500	500,000.00	500.00
600000.50	600,001	600	600,001	600	600,000.50	600.00
1250000.33	1,250,000	1,250	1,250,000	1,250	1,250,000.33	1,250.00

Enter the comma symbol after the hash (#) symbol to display a comma as a thousands separator. Enter the comma at the end of the formatting code section to scale down the number by 1000.

CURRENCY

$ (the dollar sign) – The dollar sign is used to add the currency symbol to the number.

REPEAT CHARACTERS

* (asterisk) – The asterisk is used to repeat a digit or a symbol to fill the width of the cell. The asterisk can add symbols in both the integer-part and the fractional-part of a number. The asterisk and the symbol which you want to repeat must be entered either at the beginning or the end of the code section.

	Number formatting		
Number entered	*0#,###	#,###,*0	#,###*?
1000	00001,000	1000000000	1,000????
10000	00010,000	1000000000	10,000???
500000	00500,000	5000000000	500,000??
600000.50	00600,001	6000000000	600,001??
1250000.33	1,250,000	1,250000000	1,250,000?

COLOUR FORMATTING

[COLOUR] – You can apply a different colour to each section of the custom formatting code. The available colours are black, green, blue, white, magenta, yellow, cyan and red. The colour name must be included between the square brackets and it must be the first formatting item in the code section.

	Number formatting		
Number entered	#,##0;[Red]-#,##0	[Blue]#,##0;[Red]-#,##0	[Blue]#,##0;[Red]-#,##0;[Magenta]0.00
5	5	5	5
-5	-5	-5	-5
100.50	101	101	101
-500.10	-500	-500	-500
1250000.33	1,250,000	1,250,000	1,250,000
-1250001.33	-1,250,001	-1,250,001	-1,250,001
0.00	0	0	0.00

DATES

There are three symbols used to format the dates:

1. **d (days)** – the number of d's in the code dictates how Excel displays the day.
    D – displays the day as a number from 1 to 12 without a leading zero.
    DD – shows the day as a number with a leading zero when needed.
    DDD – abbreviates the day of the week to three letters.

DDDD – displays the full name of the day.

Date entered	Date formatting			
	d	dd	ddd	dddd
1/01/2000	1	01	Sat	Saturday
25/09/2012	25	25	Tue	Tuesday
17/03/1943	17	17	Wed	Wednesday

2. **m (months)** – the number of m's in the code dictates how Excel displays the month.

   M – displays the months as a digit from 1 to 12 without a leading zero.

   MM – displays the month with a leading zero when required.

   MMM – abbreviates each month to three letters.

   MMMM – shows the full name of the month.

   MMMMM – displays the first letter of the name of the month.

Date entered	Date formatting				
	m	mm	mmm	mmmm	mmmmm
1/01/2000	1	01	Jan	January	J
25/09/2012	9	09	Sep	September	S
17/03/1943	3	03	Mar	March	M

3. **y (years)** – the number of y's in the code dictates how Excel displays the year.

   YY – the last two digits of the year are displayed.

   YYYY – displays the year.

Date entered	Date formatting	
	yy	yyyy
1/01/2000	00	2000
25/09/2012	12	2012
17/03/1943	43	1943

A combination of date formats might look something like this:

Date entered	Date formatting				
	mm/dd/yy	mmm/d/yy	yyyy/mmmm/d	mmmm	dddd, dd-mmm-yyyy
1/01/2000	01/01/00	Jan/1/00	2000/January/1	01/Jan/00	Saturday, 01-Jan-2000
25/09/2012	09/25/12	Sep/25/12	2012/September/25	25/Sep/12	Tuesday, 25-Sep-2012
17/03/1943	03/17/43	Mar/17/43	1943/March/17	17/Mar/43	Wednesday, 17-Mar-1943

As you can see, there is no particular order which date formatting symbols must follow.

TIME OF THE DAY

There are four code elements used to format the time of the day:

1. **h (hours)** – hours can be displayed either with a leading zero or without.
   H – displays the hour without a leading zero.
   HH – displays the hour as a number with a leading zero.
   [H] – shows elapsed time in hours. It should be used with formulas which calculate time and the total time is expected to exceed 24 hours.

	Time formatting		
Time Entered	h	hh	[h]
15:30	15	15	15
9:45:12	9	09	9
11:06 PM	23	23	23

2. **m (minutes)** – minutes can be displayed with a leading zero or without.
   M – displays the minute without a leading zero.
   MM – displays the minute with a leading zero when required.
   [M] – displays the elapsed time in minutes.
   The "M" or "MM" symbol must be entered immediately after the "H" or "HH", or immediately before the seconds symbols "S" or "SS". If you enter "M" or "MM" on their own, Excel will interpret the number as a month.

	Time formatting		
Time Entered	h:m	hh:mm	[m]
15:30	15:30	15:30	930
9:45:12	9:45	09:45	585
11:06 PM	23:6	23:06	1386

Notice that cells which were formatted as "[m]" show the number of minutes from 0:00 am to the time entered in the cell.

3. **s (seconds)** – minutes can be displayed with a leading zero or without.
   S – displays seconds without the leading zero.
   SS – displays seconds with a leading zero when required.
   [S] – displays the elapsed time in seconds.
   "S" or "SS" must be entered after the "M" or "MM" symbols in order for Excel to correctly display seconds. "[S]" can be used on its own.

	Time formatting		
Time Entered	h:m:s	hh:mm:ss	[s]
15:30	15:30:0	15:30:00	55800
9:45:12	9:45:12	09:45:12	35112
11:06 PM	23:6:0	23:06:00	83160

Notice that cells which were formatted as "[s]" show the number of seconds from 0:00 am to the time entered in the cell.

4. **AM/PM** – displays the hour in a 12-hour format. Otherwise the time is displayed in the 24-hour format.
This code can also be written as "am/pm", "A/P" or "a/p". The code is entered as the last item in the time code.

	Time formatting		
Time Entered	h:m:s AM/PM	hh:mm:ss a/p	hh:mm:ss AM/PM
15:30	3:30 PM	03:30:00 p	03:30:00 PM
9:45:12	9:45 AM	09:45:12 a	09:45:12 AM
11:06 PM	11:6 PM	11:06:00 p	11:06:00 PM

DELETE CUSTOM FORMATS

Each time you type in a new number format into the Type field and press OK, Excel adds the format to the list of custom formats. Eventually you will create a maximum number of custom formats and Excel will refuse to remember any new formats until you delete some of the custom formats from the list.

To delete a custom number formatting code, select the code from the list and click Delete.