
Working with Dates

by Chris Chua



Explains how
Excel handles
dates behind-
the-scenes

Foreword

This ebook is the brain child of [Chris Chua](#), founder of [DefeatExcel.com](#).

DefeatExcel aims to spread Excel literacy and empowers everyone to use Excel efficiently.

So, feel free to send and distribute this ebook to anyone who you think will benefit — family, friends and colleagues. You'll definitely make their day, and mine too!

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Enjoy this ebook and if there are any questions, as always, reach out to me at defeatexcel@gmail.com.

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Introduction

Do you know that Excel can perform calculations with dates?

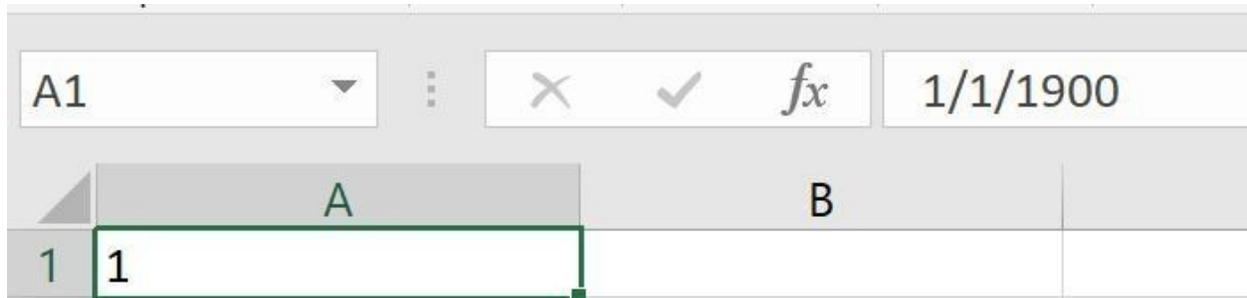
When you key in a date, Excel actually stores the date as a number behind the scenes. This number is the number of days since 0 Jan 1900.

Let's take a deeper look behind the curtains of Excel.

Taking a Peep Behind the Scenes



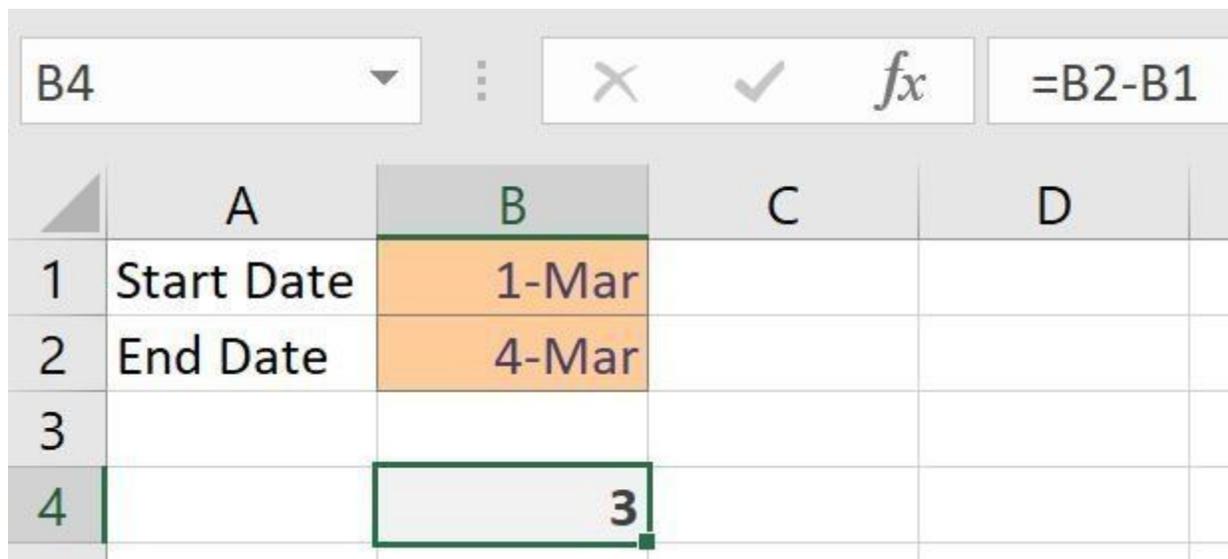
To see this number behind the scenes, you can highlight the cell with the date and press Ctrl + ` (the key beside 1).



1 Jan 1900 has the number 1 behind the scenes

Subtracting Two Dates

Since dates have a hidden number behind the scenes, this means that we can subtract two dates to find the number of days apart.

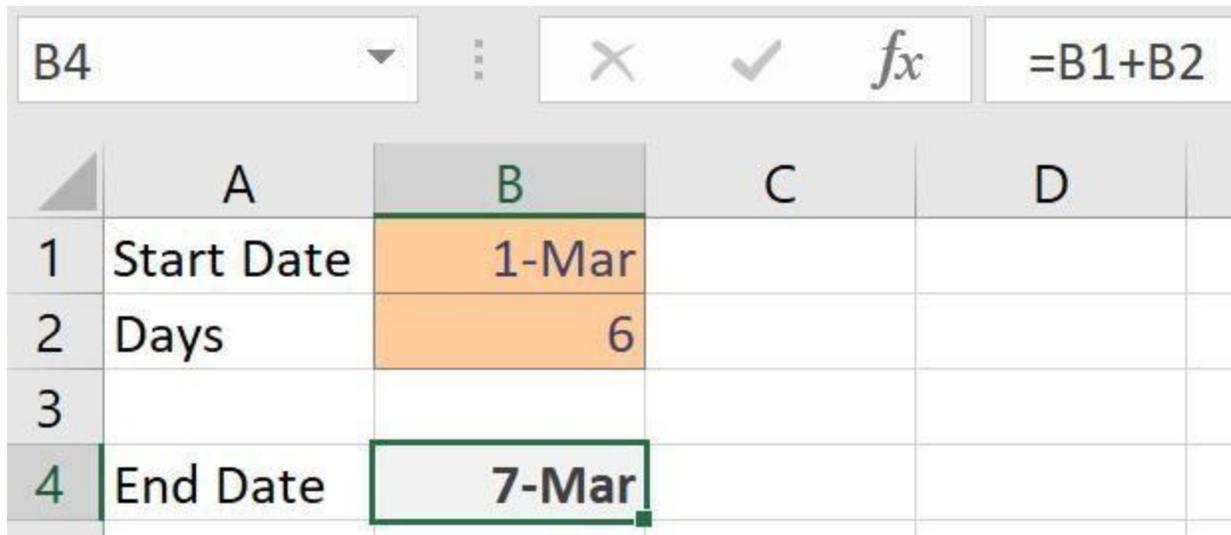


End Date - Start Date

Technically we can add two dates together since it's the addition of two numbers, but it doesn't make much sense.

Adding and Subtracting a Date and a Number

Next we can also find the Start Date or End Date using a date and a number.



	A	B	C	D
1	Start Date	1-Mar		
2	Days	6		
3				
4	End Date	7-Mar		

Date + Days

End Date After X Months

Typically used in HR, say if you want to calculate when is the End Date of a 3-month probation. The EDATE function helps you to set future dates based on the number of months.

B4					
=EDATE(B1,B2)					
	A	B	C	D	E
1	Start Date	1-Mar			
2	Months	3			
3					
4	End Date	1-Jun			

EDATE(date, months)

Last Date of the Month After X Months

In Accounting, we usually need to set up the last date of the month to present month-to-date figures. The EOMONTH function gets the last date of that particular month.

(tip: use month 0 for current month)

B3						
=EOMONTH(\$B\$1, 0)						
	A	B	C	D	E	F
1	Start Date	3-Feb				
2						
3		28-Feb	31-Mar	30-Apr	31-May	30-Jun

EOMONTH(date, months)

Finding the Difference Between Two Dates

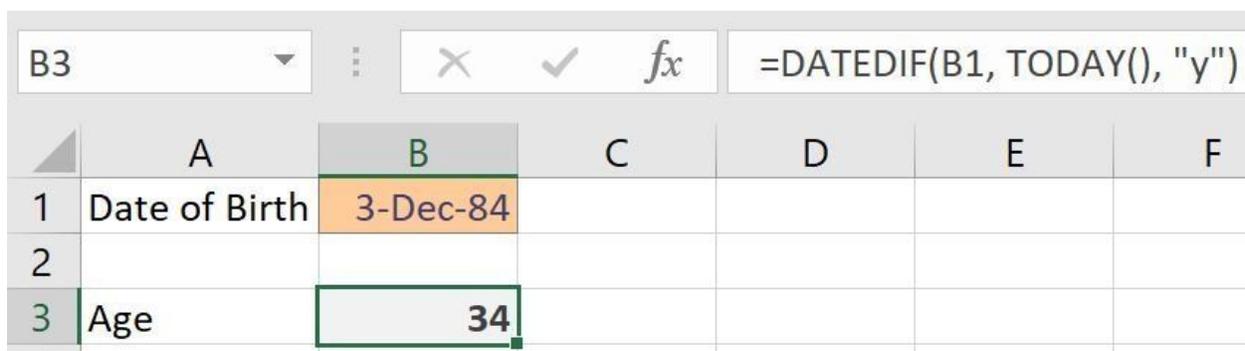
To find the difference between two dates in days, we learn that we can simply subtract the two dates. But if you want to find the number of months or years between two dates, then the DATEDIF function will come in handy.

`=DATEDIF(start_date, end_date, unit)`

We have a few options for unit:

- "y" - number of completed years
- "m" - number of completed months
- "d" - number of days
- "ym" - after ignoring years, the number of completed months
- "yd" - after ignoring years, the number of completed dates

If you are in HR, then perhaps you may need to calculate the age of an employee.



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F
1	Date of Birth	3-Dec-84				
2						
3	Age	34				

The formula bar at the top shows the formula: `=DATEDIF(B1, TODAY(), "y")`

`DATEDIF(start_date, end_date, unit)`

Finding the Number of Work Days Between Two Dates

Another function used in HR is NETWORKDAYS.INTL, which is used to find the number of work days between two dates.

```
=NETWORKDAYS.INTL(start_date, end_date, [weekend], [holidays])
```

The format for weekend is a series of 7-digit number starting from Monday to Sunday, with 1 for not working and 0 for working. So for an employee not working on Saturdays and Sundays, their weekend format will be "0000011".

For more examples, please see Microsoft's article on [NETWORKDAYS.INTL](#).

Finding the End Date Given Start Date and Number of Work Days

Similar to the previous NETWORKDAYS.INTL, the WORKDAY.INTL function works by finding the End Date given the Start Date and the number of work days.

```
=WORKDAY.INTL(date, days, [weekend], [holidays])
```

Its power shines in the HR industry where you can use a negative number of work days to count backwards from the date given.

Supposed we have an employee whose last day is 26 Dec 2018. He has 7 days of annual leave and the management has agreed for him to offset them against 26 Dec 2018.

So what's his actual last day in the office?

	A	B	C	D	E
1	Notice Served Till	26-Dec-18			
2	Annual Leave	7			
3					
4	Last Work Day	17-Dec-18			

`WORKDAY.INTL(date, days, [weekend], [holidays])`

Display the Day of Week

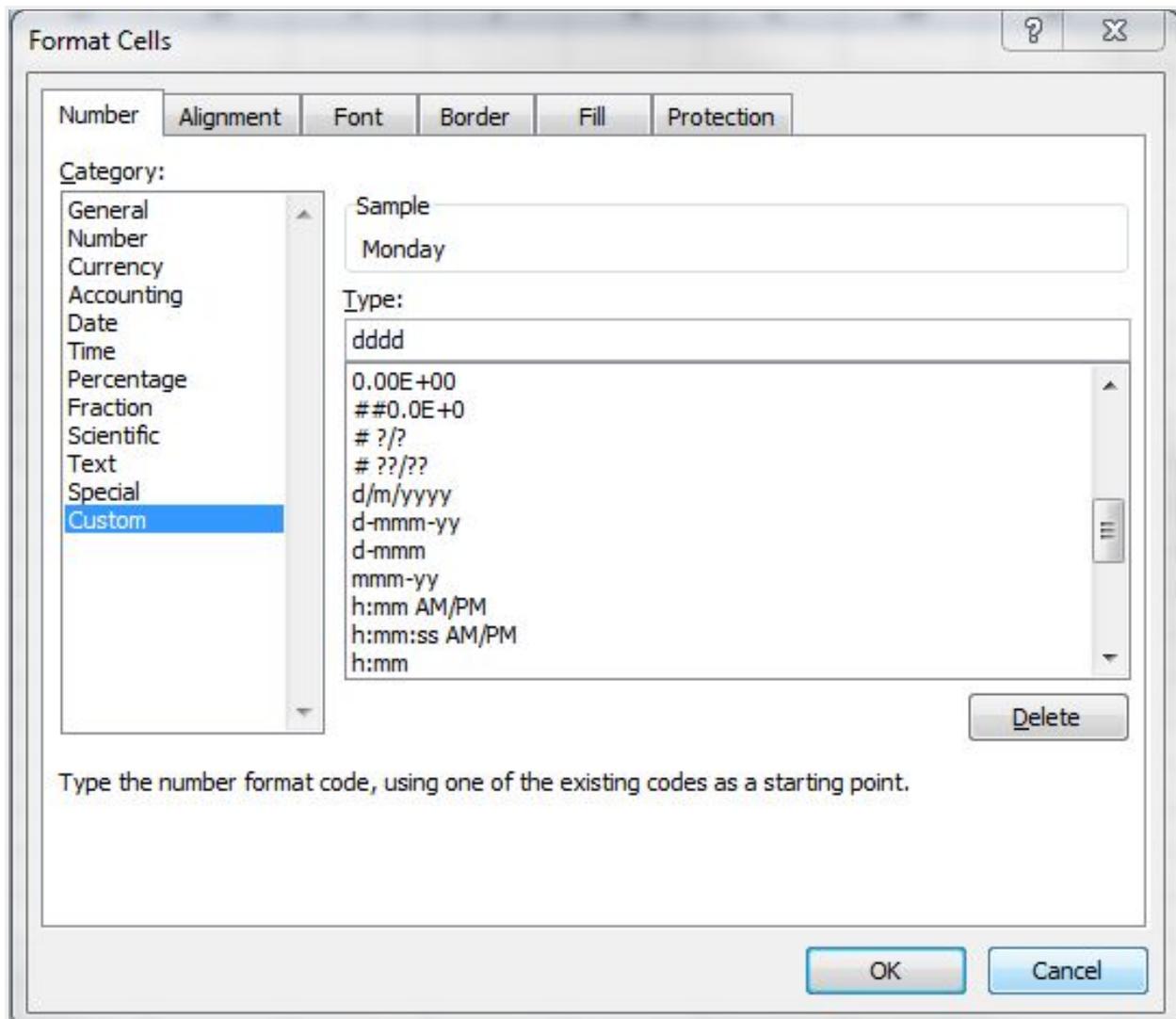
Sometimes we just want to display the day of the week instead of the date itself.

To do that, highlight the cell containing the date and go to **Home | Number** and click on the dropdown menu and select **More Number Formats**. Or you can simply press Ctrl + 1 as a keyboard shortcut.

Under Format Cells | Category | Custom | Type, in the box, type in:

ddd: for 3 letter abbreviations e.g. Mon, Tue, Wed

dddd: for the long form of the day e.g. Monday, Tuesday, Wednesday



Custom Number Format

Conclusion

Working with dates is one of the modules in my self-paced online course, DataCraft. If you like this article and is interested in mastering Excel to jumpstart your career, check out this [premium course on data analysis](#) — the fast track to Excel mastery.