

Calendar

A table in a calendar dimension is known as a calendar table in power bi, the function used to create such tables is calendar DAX function, basically there are two simple steps involved in the creation of a calendar table first is to create a calculated table and then sort orders.

Power BI Calendar Table

In order to have the above result, we need to create a "Calendar" table in Power BI. In this article, we will show you how to create a "Calendar" table in Power BI. When you have a sales table or any other data table with dates you may want to create a separate table which includes only dates, year, month, and day column so that based on the "Date" column we can create a relationship between two tables later on.

The screenshot displays the Power BI interface with a table titled "Power BI Calendar". The table has columns for Date, Year, Month #, Month Na, and Week #. The first row shows data for 29-Sep-18, 2018, 9, and September. A red dashed box highlights the DAX formula in the formula bar: `1 Month # = MONTH('Data Table'[Date])`. A callout bubble points to the formula with the text "Calendar DAX Function". On the right, the Fields pane shows a context menu with options: "New measure", "New column" (highlighted with a dashed box), "New quick measure", "New column" (highlighted with a yellow box), and "Copy Table".

Date	Year	Month #	Month Na	Week #
29-Sep-18	2018	9	September	
30-Sep-18	2018	9	September	
01-Oct-18	2018	10	October	
02-Oct-18	2018	10	October	
03-Oct-18	2018	10	October	
04-Oct-18	2018	10	October	
05-Oct-18	2018	10	October	
06-Oct-18	2018	10	October	
07-Oct-18	2018	10	October	
08-Oct-18	2018	10	October	
09-Oct-18	2018	10	October	

How to Create Simple Calendar Table in Power BI

To build a calendar table in Power BI, we need to make use of DAX function i.e. "CALENDAR". Calendar function helps us to create the calendar table by specifying the start date and end date.

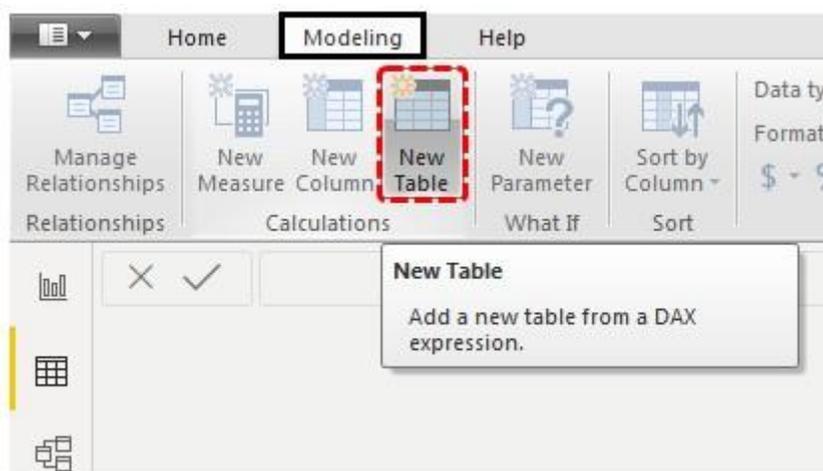
Below is the syntax of the CALENDAR function in Power BI.

CALENDAR (Start Date, End Date)

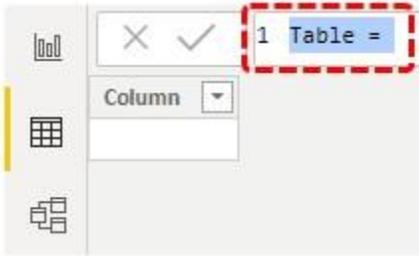
The syntax is simple we just need to provide **Start Date** and **End Date**.

Now we will create a calendar table from 01st Jan 2019 to 31st Jan 2019. Follow the below steps to create a calendar table in Power BI.

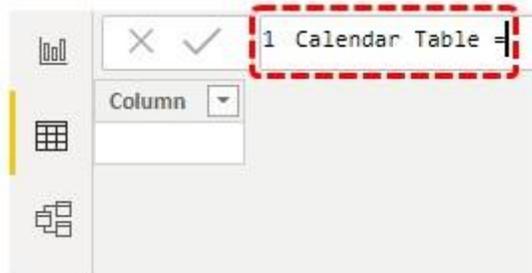
- **Step 1:** Open blank Power BI file and Under "Modelling" tab click on "New Table".



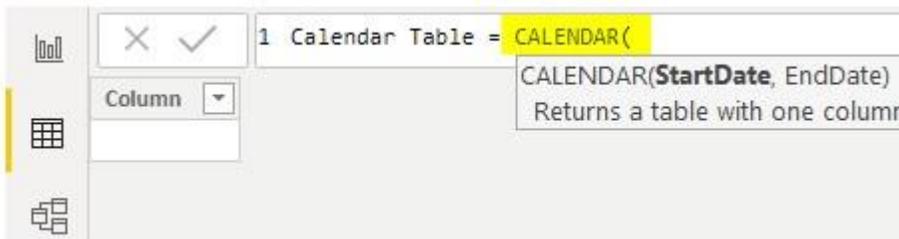
- **Step 2:** Now it will ask you to name the table.



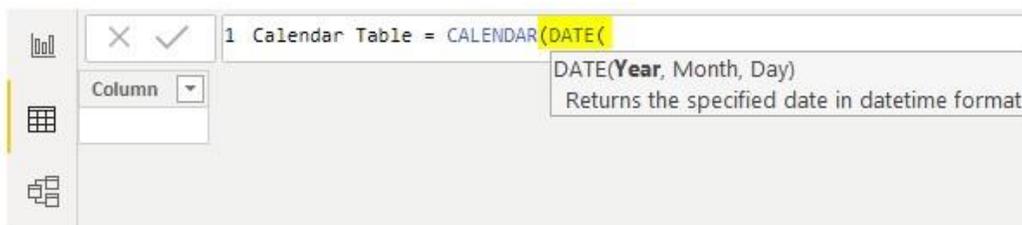
- **Step 3:** Now give the name to it as "Calendar Table".



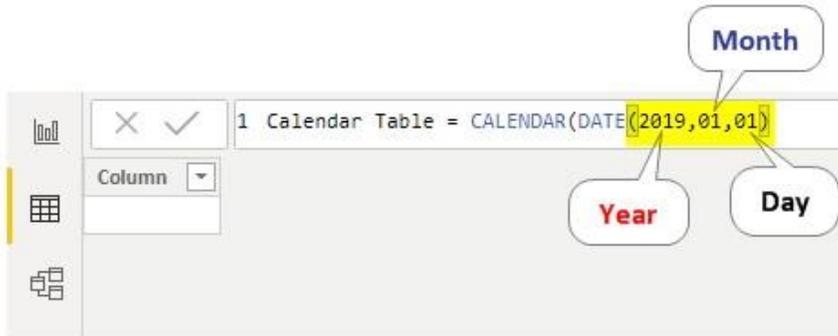
- **Step 4:** Now open CALENDAR DAX function.



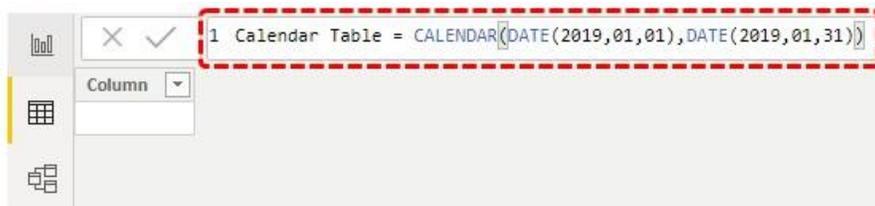
- **Step 5:** Here is a catch i.e. we don't know what format to put for a date, so by enclosing DATE function we can specify Year, Month, and Day. So open DATE DAX function now.



Step 6: DATE function has three elements i.e. Year, Month, and Day for this enter the starting date year, month, and day. Since our starting date is 01st Jan 2019 enter the arguments as follows.



- Step 7:** Once the start date is specified similarly we need to specify the end date as well. Our end date is 31st Jan 2019. For this open DATE function and pass the numbers accordingly.



Ok, after this close two brackets and hit enter key, we will have the DATE column in the newly inserted table.

The image shows the data table editor after the formula has been executed. The formula bar still shows: "1 Calendar Table = CALENDAR(DATE(2019,01,01),DATE(2019,01,31))". Below the formula bar, a "Date" column has been created, and its values are listed in a table:

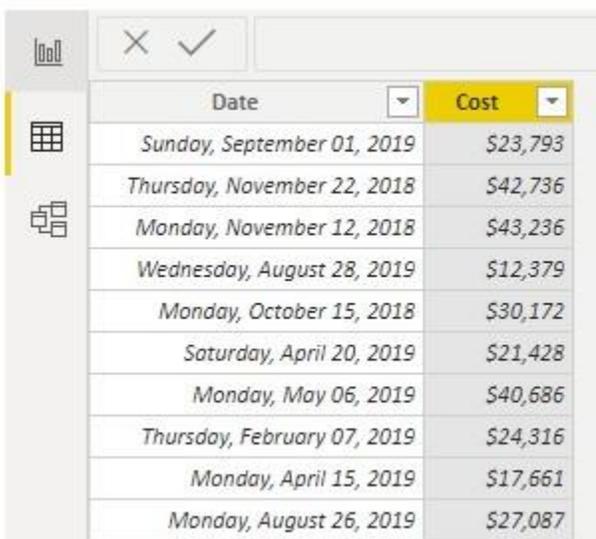
Date
1/1/2019 12:00:00 AM
1/2/2019 12:00:00 AM
1/3/2019 12:00:00 AM
1/4/2019 12:00:00 AM
1/5/2019 12:00:00 AM
1/6/2019 12:00:00 AM
1/7/2019 12:00:00 AM
1/8/2019 12:00:00 AM

Here you go we have dates from 01st Jan 2019 to 31st Jan 2019.

Build Calendar From Data Tables in Power BI

The above one we have seen was entering the start date and end date manually but when we have a date column in the data table and from that column if you want to build a calendar table then that is also a possibility.

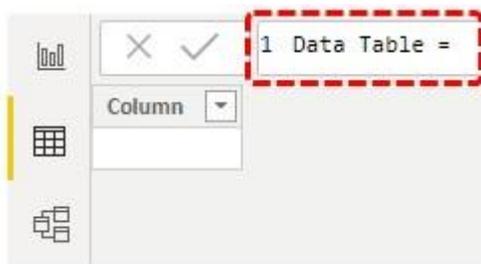
Below is the data I have uploaded to Power BI, you can download the excel workbook to use it.



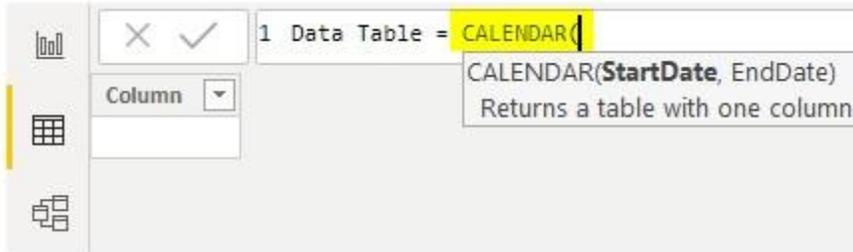
Date	Cost
Sunday, September 01, 2019	\$23,793
Thursday, November 22, 2018	\$42,736
Monday, November 12, 2018	\$43,236
Wednesday, August 28, 2019	\$12,379
Monday, October 15, 2018	\$30,172
Saturday, April 20, 2019	\$21,428
Monday, May 06, 2019	\$40,686
Thursday, February 07, 2019	\$24,316
Monday, April 15, 2019	\$17,661
Monday, August 26, 2019	\$27,087

In this table we have different date ranges, so by using DAX functions, we will get the start date and end date dynamically.

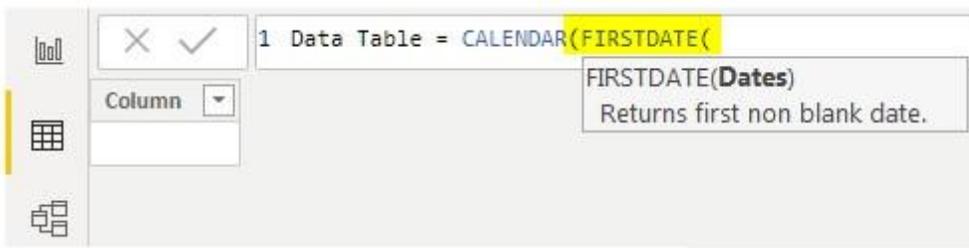
- Go to "Modelling" tab and click on "New Table". Give the name to the table as "Date Table".



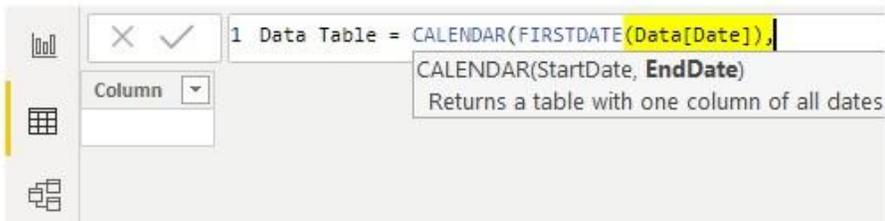
Open CALENDAR function first.



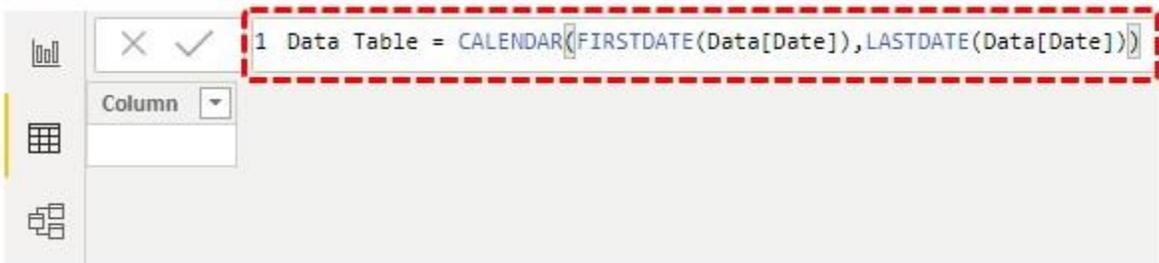
- For **Start Date**, we cannot give DATE function here because we don't know exactly what is the starting date from our data table So to automatically fetch the starting date from the table we need to use "FIRST DATE" function.



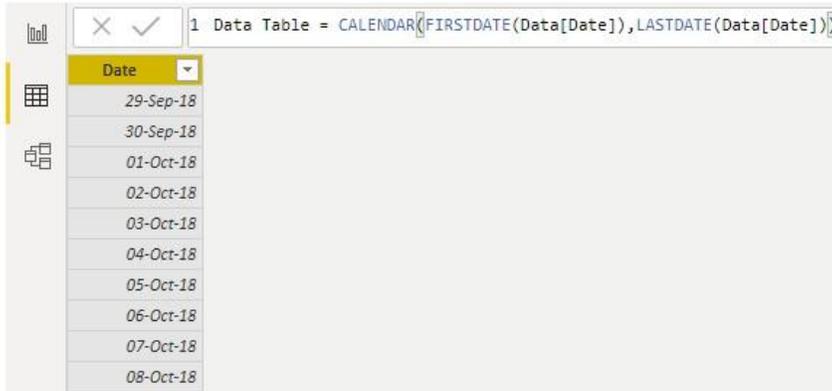
- For this DAX function give the date column name from the "Data Table".



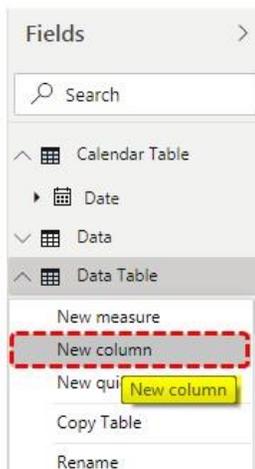
- For **End Date** use the **LAST DATE** DAX function and give DATE column reference from "Data Table".



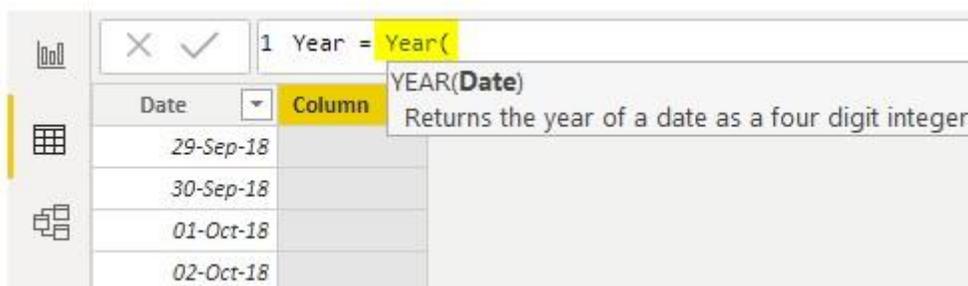
- Close two brackets and hit enter key we should get "Date Calendar" from the "Data Table" automatically.



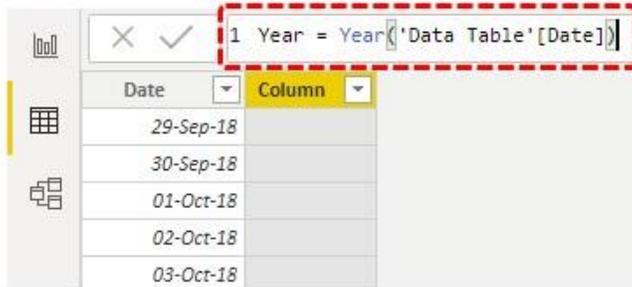
- Now from this "Date" column, we can create Year, Month, Day, Week Number, Quarter number in separate columns. Right-click on the "Data Table" and choose "New Column".



- This will ask you to name the column and name the column as "YEAR" and open the "YEAR" function to extract the year from the date.



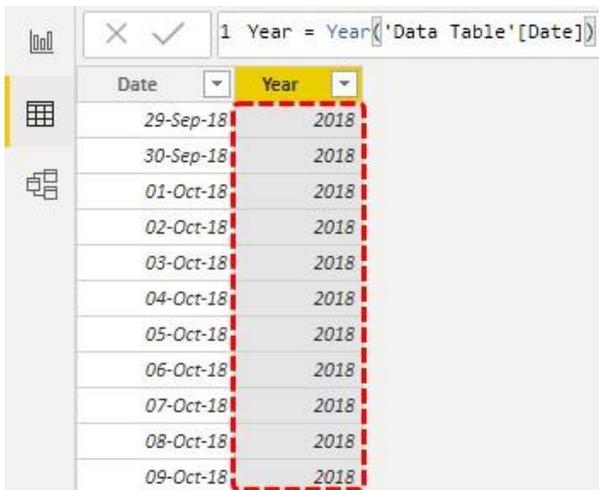
For this function reference the "Date" column from the "Date Table".



The screenshot shows a data table with a formula bar at the top. The formula bar contains the text: `1 Year = Year('Data Table'[Date])`. The table below has two columns: "Date" and "Column". The "Date" column contains dates from 29-Sep-18 to 03-Oct-18. The "Column" column is currently empty.

Date	Column
29-Sep-18	
30-Sep-18	
01-Oct-18	
02-Oct-18	
03-Oct-18	

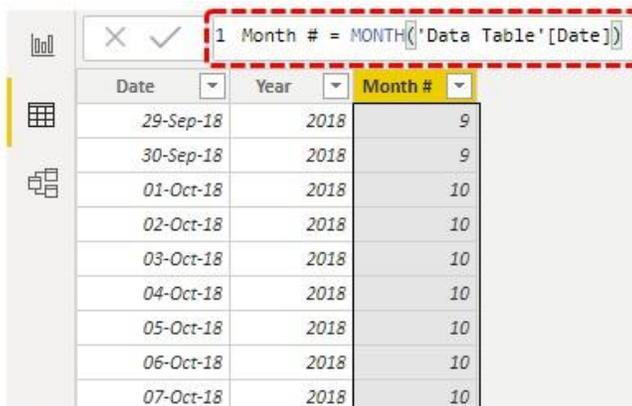
Hit enter key and we should get "Year" from the date column.



The screenshot shows the same data table as before, but now the "Column" header has been replaced with "Year". The cells in the "Year" column all contain the value "2018".

Date	Year
29-Sep-18	2018
30-Sep-18	2018
01-Oct-18	2018
02-Oct-18	2018
03-Oct-18	2018
04-Oct-18	2018
05-Oct-18	2018
06-Oct-18	2018
07-Oct-18	2018
08-Oct-18	2018
09-Oct-18	2018

Similarly, extract the "Month" number from the "Date" column.



The screenshot shows the same data table as before, but now the "Column" header has been replaced with "Month #". The cells in the "Month #" column contain the month numbers: 9 for the first two rows and 10 for the remaining rows.

Date	Year	Month #
29-Sep-18	2018	9
30-Sep-18	2018	9
01-Oct-18	2018	10
02-Oct-18	2018	10
03-Oct-18	2018	10
04-Oct-18	2018	10
05-Oct-18	2018	10
06-Oct-18	2018	10
07-Oct-18	2018	10

Often times we need month name, so for this by using Format function we will select the "Date" column and format it as the only month i.e. "MMMMM".

Below is the formula we have applied to get only the "Month" name.

Date	Year	Month #	Month Name
29-Sep-18	2018	9	September
30-Sep-18	2018	9	September
01-Oct-18	2018	10	October
02-Oct-18	2018	10	October
03-Oct-18	2018	10	October
04-Oct-18	2018	10	October
05-Oct-18	2018	10	October
06-Oct-18	2018	10	October
07-Oct-18	2018	10	October

To get a week number use the below formula.

Date	Year	Month #	Month Name	Week #
29-Sep-18	2018	9	September	7
30-Sep-18	2018	9	September	1
01-Oct-18	2018	10	October	2
02-Oct-18	2018	10	October	3
03-Oct-18	2018	10	October	4
04-Oct-18	2018	10	October	5
05-Oct-18	2018	10	October	6
06-Oct-18	2018	10	October	7
07-Oct-18	2018	10	October	1
08-Oct-18	2018	10	October	2

Now we need to decide the "Quarter" number so for this we need to use the "IF" condition, so below is the formula to get "Quarter #".

Date	Year	Month #	Month Name	Week #	Q #
29-Sep-18	2018	9	September	7	Q3
30-Sep-18	2018	9	September	1	Q3
01-Oct-18	2018	10	October	2	Q4
02-Oct-18	2018	10	October	3	Q4
03-Oct-18	2018	10	October	4	Q4
04-Oct-18	2018	10	October	5	Q4
05-Oct-18	2018	10	October	6	Q4
06-Oct-18	2018	10	October	7	Q4
07-Oct-18	2018	10	October	1	Q4
08-Oct-18	2018	10	October	2	Q4
09-Oct-18	2018	10	October	3	Q4
10-Oct-18	2018	10	October	4	Q4

This function is very similar to the one we use in MS Excel.

Note: Power BI Calendar file can also be downloaded from the link below and the final output can be viewed.

Things to Remember Here

- Calendar table needs to be created from the DAX function CALENDAR only in power bi.
- Start and end dates are referenced by First Date and Last Date to create a calendar table from other existing tables.
- In Power BI, Calendar Table will be inserted as a new table only.