

Power BI Desktop

Sample manual - first two chapters



Wise Owl
Training

TABLE OF CONTENTS (1 of 6)

1	POWER BI BASICS	Page
1.1	What is Power BI Desktop?	8
1.2	Installing and Updating Power BI	9
	<i>From Microsoft Store</i>	9
	<i>Installing without Automatic Updates</i>	9

2	GETTING STARTED	Page
2.1	Getting Started in Power BI Desktop	10
	<i>Example for this Chapter</i>	10
2.2	Working with Files	11
	<i>Creating New Files</i>	11
	<i>Opening and Saving Files</i>	11
2.3	Views in Power BI Desktop	12
	<i>Switching Panes</i>	12
	<i>Report, Table and Model View</i>	13
2.4	Getting Data	14
2.5	Transforming Data	15
	<i>Editing Queries / Transforming Data</i>	15
	<i>The Power BI Query Editor</i>	16
	<i>Promoting Row Headers</i>	16
	<i>Replacing Values</i>	17
	<i>Changing Data Types</i>	17
	<i>Removing Columns</i>	17
2.6	Creating Visuals	18
	<i>Inserting a Visual</i>	18
	<i>Assigning Grouping Fields to a Visual</i>	18
	<i>Assigning Numerical Fields</i>	19
2.7	Three Ways to Format Visuals	20
	<i>In Situ Selection</i>	20
	<i>Changing what's on your Chart</i>	20
	<i>The Format Pane</i>	21
2.8	Publishing your Report	22

3	IMPORTING DATA	Page
3.1	Our Example	23
3.2	Importing from Different Sources	24
	<i>Re-Using a Data Source</i>	24
3.3	Importing from Excel	25
3.4	Importing CSV or Text Files	26
3.5	Importing from SQL Server	26
	<i>Using Queries and Stored Procedures</i>	28
	<i>Passing Arguments to Stored Procedures</i>	28
3.6	Importing from a Website	29
3.7	Entering Data Manually	30
	<i>Pasting Data</i>	30
	<i>Typing in Data</i>	31

4	DATA MODELS	Page
4.1	Data Models	32
	<i>Viewing a Model</i>	32
	<i>Selecting Single Model Items</i>	33
	<i>Selecting Multiple Items</i>	33
	<i>Searching for Fields</i>	33
4.2	Model Diagrams	34
	<i>Arranging Tables in a Model</i>	34
	<i>Diagram Layouts</i>	34
	<i>Collapsing and Expanding Tables</i>	35
	<i>Controlling Expand/Collapse Field Visibility</i>	35
	<i>Seeing Table Information</i>	35
4.3	Hiding Objects	36
	<i>Why you might Want to Hide Tables and Fields</i>	36
	<i>Hiding Tables</i>	37
	<i>Hiding Fields/Columns</i>	37
4.4	Model Properties	38
	<i>Table Properties</i>	38
	<i>Display Folders</i>	38
	<i>Default Number and Date Formatting</i>	39
	<i>Changing the Default Aggregation for a Field</i>	39
4.5	Relationships	40
	<i>The Need for Relationships</i>	40
	<i>Parent-Child Relationships</i>	40
	<i>Creating a Relationship</i>	41
	<i>Editing Relationships</i>	41
	<i>The Effect of Relationships</i>	42
	<i>Cross-Filter Direction</i>	42

TABLE OF CONTENTS (2 of 6)

5	VISUALS	Page
5.1	Overview of Visuals	43
5.2	Adding and Changing Visuals	44
	<i>Adding a Visual then Selecting its Data</i>	44
	<i>Data-First Visual Creation</i>	45
	<i>Changing Visual Types</i>	45
5.3	Working with Visuals	46
	<i>The Visual Header</i>	46
	<i>Focus Mode</i>	46
	<i>Spotlight Mode</i>	46
	<i>Resizing a Visual</i>	47
	<i>Selecting Visuals</i>	47
	<i>Moving, Copying and Deleting Visuals</i>	47
	<i>Locking Visuals</i>	48
	<i>Aligning and Distributing Visualisations</i>	48
	<i>Grouping Visualisations</i>	49
	<i>Showing a Visual's Underlying Data</i>	50
5.4	The Selection Pane	51
	<i>Viewing the Selection Pane</i>	51
	<i>Changing the Visual Layer Order</i>	52
	<i>Changing the Tab Order</i>	52
	<i>Hiding Visuals</i>	52

6	VISUAL INTERACTIONS	Page
6.1	Overview	53
6.2	Editing Visual Interactions	54
	<i>What the 3 Symbols Mean</i>	55

7	FORMATTING VISUALS	Page
7.1	Finding Formatting Properties	56
	<i>Searching for a Property</i>	56
	<i>Finding a Property</i>	56
7.2	Common Formats to Apply	57
	<i>Setting Visual Backgrounds</i>	57
	<i>Borders and Shadow Effects</i>	58
	<i>Titles, Subtitles and Dividing Lines</i>	59
7.3	Header Icons	60
7.4	Tooltips	61
7.5	Useful General Formatting Tricks	62
	<i>The Wonderful Format Painter</i>	62
	<i>Expanding and Collapsing Cards</i>	63
	<i>Removing all Formatting</i>	63
7.6	Themes	64

8	TABLES	Page
8.1	Basic Tables	65
8.2	Working with Table Columns	65
	<i>Sorting Tables by Columns</i>	66
	<i>Re-ordering Columns</i>	66
	<i>Changing Column Widths Automatically</i>	66
	<i>Changing Column Widths Manually</i>	67
	<i>Changing Word Wrap Options</i>	67
	<i>Renaming Columns</i>	68
8.3	Aggregating Data	69
8.4	Formatting Numbers	70
	<i>Formatting Numbers within a Single Table</i>	70
	<i>Formatting Numbers for all Visuals</i>	71
	<i>Setting Custom Number Formats</i>	71
8.5	Working with Dates in Tables	72
	<i>Displaying Dates as Dates</i>	72
	<i>Changing the Default Format for a Date</i>	72
	<i>Setting a Custom Date Format</i>	73
8.6	Specific to Formatting Tables	74
	<i>Column Headers</i>	74
	<i>Totals</i>	74
	<i>Font Size and Typeface</i>	75
	<i>Table Padding and Gridlines</i>	75
	<i>Table Styles</i>	76
	<i>Formatting Columns Individually</i>	76

9	CONDITIONAL FORMATTING	Page
9.1	Conditional Formatting	77
9.2	Applying Conditional Formatting	78
	<i>Setting Conditional Formatting</i>	78
	<i>Changing Conditional Formatting</i>	78
9.3	Gradient Effects	79
	<i>Adding a Middle Colour</i>	79
9.4	Rules-Based Conditional Formatting	80
9.5	Formatting Using Field Values	81
9.6	Data Bars	82
9.7	Displaying Icons	83

TABLE OF CONTENTS (3 of 6)

10	MATRICES	Page
10.1	Overview of Matrices	84
10.2	Creating a Matrix	85
	<i>The Sections of a Matrix</i>	85
	<i>Sorting in a Matrix</i>	85
10.3	Multiple Rows, Columns and Values	86
	<i>Multiple Row Fields</i>	86
	<i>Multiple Values Fields</i>	87
	<i>Multiple Column Fields</i>	87

11	TEXT BOXES, IMAGES AND SHAPES	Page
11.1	Overview	88
	<i>Drawing Text Boxes, Images or Shapes</i>	88
11.2	Images	89
	<i>Scaling Images</i>	89
	<i>Adding a Hyperlink to an Image</i>	89
11.3	Text Boxes	90
	<i>Inserting Values</i>	90
11.4	Shapes	90
	<i>Adding a Shape</i>	91

12	FILTERING REPORTS	Page
12.1	How Filters Work	92
12.2	Working with Filters	93
	<i>Showing the Filters Pane</i>	93
	<i>Applying a Basic Filter</i>	93
	<i>Adding Fields to the Filters Pane</i>	94
	<i>Removing a Filter</i>	94
	<i>Advanced Text Filters</i>	94
	<i>Advanced Number Filters</i>	95
	<i>Relative Date Filtering</i>	95
	<i>Top and Bottom Filters</i>	96
	<i>Sorting Filters</i>	96
12.3	Formatting Filters	97
12.4	Controlling Filters for End Users	98
	<i>Locking and Hiding Filters</i>	98
	<i>Report Filter Settings</i>	98

13	SLICERS	Page
13.1	Introducing Slicers	99
13.2	Working with Slicers	100
	<i>Creating a Slicer</i>	100
	<i>Selecting and Clearing Items</i>	100
	<i>Changing Selection Behaviour</i>	101
	<i>Searching in Slicers</i>	101
	<i>Dropdown Slicers</i>	101
	<i>Tile Slicers</i>	102
	<i>Customising your Slicer Header</i>	103
13.3	Hierarchical Slicers	104
13.4	Number and Date Slicers	105
	<i>Sliders</i>	105
	<i>Choosing Dates</i>	105
	<i>Picking Relative Dates</i>	106
	<i>Changing the Anchor Date</i>	106

14	NEW SLICERS	Page
14.1	Overview of the New Slicer Visual	107
	<i>Benefits of the New Slicer Visual</i>	107
	<i>Enabling the Visual</i>	107
14.2	Working with the New Slicer	108
	<i>Adding a New Slicer Visual</i>	108
	<i>Basic Configuration</i>	108
	<i>Adding Images and Text</i>	109
	<i>Adding Hover and Selection Effects</i>	110

15	DRILL-THROUGH FILTERS	Page
15.1	What are Drill-Through Filters?	111
15.2	Creating a Drill-through Filter	112
	<i>Step 1 – Create the Main Report Page</i>	112
	<i>Step 2 – Create the Drill-Through Target Page</i>	112
	<i>Step 3 – Name and Hide your Drill-Through Page</i>	113
	<i>Step 4 – Configuring your Drill-Through Page</i>	113
	<i>Step 5 – Testing your Drill-Through Page</i>	113
15.3	Three Ways to Drill Through	114
	<i>Modern Tooltips (Left Clicking)</i>	114
	<i>Right-Clicking</i>	114
	<i>Using a Drill-Through Button</i>	114
15.4	Adding a Context-Sensitive Title	115
15.5	Extra Drill-through Options	116
	<i>Keeping All Filters</i>	116
	<i>Drill-through from Summarised Fields</i>	116

TABLE OF CONTENTS (4 of 6)

16	QUERYING DATA	Page
16.1	What are Queries?	117
16.2	Working with Queries	118
	Opening the Query Editor	118
	The Query Editor	118
	Default Query Steps	119
	Viewing Data at Different Steps	119
	Editing a Query Step	119
	Renaming Steps	120
	Deleting a Query Step	121
	Deleting Multiple Query Steps	121
	Adding a New Step	121
	Viewing M Formulae	122
	Applying Query Changes	122
16.3	Common Transforms	123
	Changing Data Types	123
	Renaming Columns	123
	Removing Columns	124
	Removing Rows	124
	Sorting Rows	125
	Filtering Rows	125
	Splitting Columns by Delimiter	126
	Splitting Columns by Number of Characters	126
	Extracting Values	127
	Replacing Values	127
	Duplicating Columns	127
16.4	Creating New Columns	128
	Creating a Column by Example	128
	Creating a Formula	128
	Creating Conditional Columns	130

17	CALCULATED COLUMNS	Page
17.1	Introduction to Calculated Columns	131
17.2	Creating Calculated Columns	132
	Starting a New Calculated Column	132
	Typing a Formula	132
	Multi-line Editing	132
	Comments and Indentation	133
	Zooming In and Out	133
	Formatting DAX	133
17.3	Conditional Functions	134
	The IF Function	134
	Operators in DAX	134
	The SWITCH Function	135
17.4	The RELATED Function	136
17.5	Blanks	137
	Testing for Blanks	137
	Creating Blanks	137
	Blank Arithmetic	137
17.6	Testing for Errors	137

18	CHART BASICS	Page
18.1	The Parts of a Chart	139
18.2	Types of Chart Available	140
18.3	Working with Charts	141
	Creating a Chart	141
	Suggesting Chart Types	141
	Sorting Charts	142
	Zoom Sliders	143
	Excluding and Including Data	144
18.4	Quick Ways to Format Charts	145
18.5	Chart Legends	146
18.6	Detail Labels	147
	Leader Lines for Data Labels	148
	Total Labels	148
18.7	Background and Gridlines	149
	Plot Area and Background	149
	Gridlines	149
18.8	Axes	150
	Categorical versus Continuous Formatting	150
	Formatting Axes	151
	Scaling Ranges	151
	Spacing Categories	151
18.9	Conditional Formatting	152

TABLE OF CONTENTS (5 of 6)

19	SMALL MULTIPLES	Page
19.1	Overview of Small Multiples	153
19.2	Creating and Formatting Small Multiples	154
	<i>Setting Grid Width and Height</i>	154
	<i>Formatting Small Multiple Titles</i>	155
	<i>Other Formatting Options</i>	155
	<i>Suppressing Axis Titles</i>	156
	<i>Using Different Axes for Different Charts</i>	156
19.3	Making the Background Colour Dynamic	157

20	MORE ON CHARTS	Page
20.1	Line, Combination and Area Charts	158
	<i>Multiple Fields in Line Charts</i>	158
	<i>Line Formatting</i>	159
	<i>Secondary Axes</i>	160
	<i>Combination Charts</i>	160
	<i>Area Charts</i>	161
20.2	Pie, Donut and Treemap Charts	162
	<i>Formatting Pie and Donut Charts</i>	162
20.3	Scatter and Bubble Charts	163
	<i>Creating Scatter Charts</i>	163
	<i>Making Bubble Charts</i>	163
	<i>Formatting Scatter and Bubble Charts</i>	164
	<i>Animating Bubble Charts</i>	165

21	GROUPING AND BINNING	Page
21.1	Grouping	166
	<i>Starting a Group</i>	166
	<i>Editing Groups</i>	167
	<i>Using Group Fields</i>	167
21.2	Binning	167

22	DRILL-DOWN	Page
22.1	Drill-Down for Charts	169
	<i>What is Drill-Down?</i>	169
	<i>Enabling Drill Down</i>	169
	<i>Drilling Down</i>	170
	<i>Drilling Up</i>	170
	<i>What Happens when you Drill Down</i>	171
	<i>Drill Down and Visual Interactions</i>	171
	<i>Viewing the Next Hierarchy Level</i>	172
	<i>Expanding All Levels in a Hierarchy</i>	172
22.2	Drill-Down in a Matrix	173
	<i>Choosing Row or Column Fields</i>	173

23	CARDS	Page
23.1	New Cards	174
23.2	Working with Cards	175
	<i>Creating a New Card</i>	175
	<i>Formatting Card Values and Labels</i>	175
	<i>Formatting the Numbers in Cards</i>	176
	<i>Card Shapes</i>	176
	<i>Formatting the Cards Themselves</i>	177
	<i>Adding Images to Cards</i>	177
23.3	Reference Labels	178
23.4	Multi-row Cards	179

24	GAUGES	Page
24.1	Gauges	180
	<i>Adding a Gauge</i>	180
	<i>Minimum, Maximum and Target Values</i>	181
	<i>Formatting Gauges</i>	181

25	KEY PERFORMANCE INDICATORS (KPIs)	Page
25.1	Overview of KPIs	182
	<i>Creating a KPI</i>	182
25.2	Creating Targets	183
	<i>Formatting KPIs</i>	184

26	CUSTOM VISUALS	Page
26.1	What are Custom Visuals?	185
26.2	Adding Custom Visuals	186
	<i>Pinning Custom Visuals</i>	186
26.3	Working with Custom Visuals	187
	<i>Applying a Custom Visual</i>	187
	<i>Removing Custom Visuals</i>	187

TABLE OF CONTENTS (6 of 6)

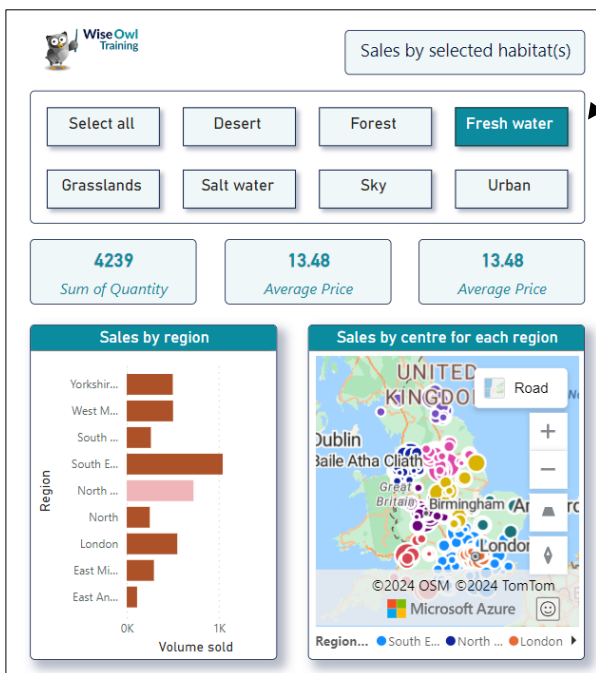
27	MAPS	Page
27.1	Overview of Maps	188
27.2	Choosing a Map Visual	189
27.3	Maps Using Latitude and Longitude	190
	<i>Stopping Aggregation for Simple Maps</i>	190
	<i>Changing the Aggregation Method for Locations</i>	191
27.4	Maps without Latitude and Longitude	192
	<i>Using a Recognised Geographical Entity</i>	192
	<i>Categorising Columns as Places</i>	192
	<i>Fixing Locations to the UK</i>	193
	<i>Converting Postcodes to Latitude/Longitude</i>	193
27.5	General Maps	194
	<i>Treating Maps as Visuals</i>	194
	<i>Changing the Map Style</i>	194
	<i>Conditional Formatting</i>	195
	<i>Manual Zoom Settings</i>	196
	<i>Viewing Controls</i>	197
	<i>Selecting Points on a Map</i>	197
	<i>Selecting within Driving Time/Distance</i>	198
	<i>Drill-Down in Maps</i>	198
27.6	Specific Types of Maps	199
	<i>Bubble Maps</i>	199
	<i>Heat Maps</i>	200
	<i>Cluster Maps</i>	201
27.7	Layers	201
	<i>3D Column Layers</i>	202
	<i>Traffic Layers</i>	202
	<i>Reference Layers</i>	203

28	PUBLISHING	Page
28.1	Overview of Publishing	204
28.2	An Infinite Number of Variables	205
	<i>Your Power BI Licence</i>	205
	<i>Linking to Data</i>	205
	<i>Data Sources</i>	206
28.3	Workspaces	207
	<i>Choosing a Workspace</i>	207
28.4	Creating Workspaces	208
28.5	Publishing Reports	209
28.6	Viewing and Editing Reports	210
	<i>Reports and Datasets</i>	210
	<i>Viewing Individual Reports</i>	210
	<i>Editing a Report</i>	211
28.7	Dashboards and Tiles	212
	<i>Adding Tiles to Dashboards</i>	212
	<i>Using Tiles</i>	212
28.8	Lineage View	213
28.9	Refreshing Data	213
	<i>Types of Connection</i>	214
	<i>Types of Refresh</i>	215
	<i>Web Connections: a Warning</i>	215
	<i>Viewing and Managing Connections</i>	216
	<i>Viewing Individual Connections</i>	216
	<i>Scheduling Refreshes</i>	217
28.10	Sharing and Exporting Reports	218
	<i>Creating a PowerPoint Presentation</i>	218
	<i>Exporting to PDF</i>	219
	<i>Generating a Public URL for your Report</i>	219
	<i>Embedding your Report in a Website</i>	220
	<i>Creating a Power BI Report File</i>	220
	<i>Sharing a Report</i>	220

CHAPTER 1 - POWER BI BASICS

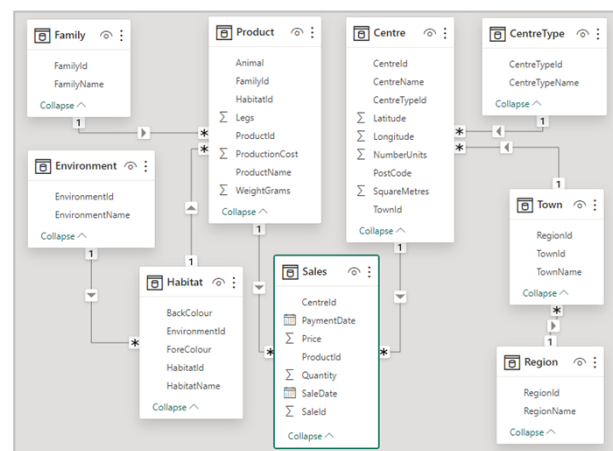
1.1 What is Power BI Desktop?

Power BI Desktop is a standalone software application from Microsoft which allows you to load data into a model, and then create pretty reports like this:



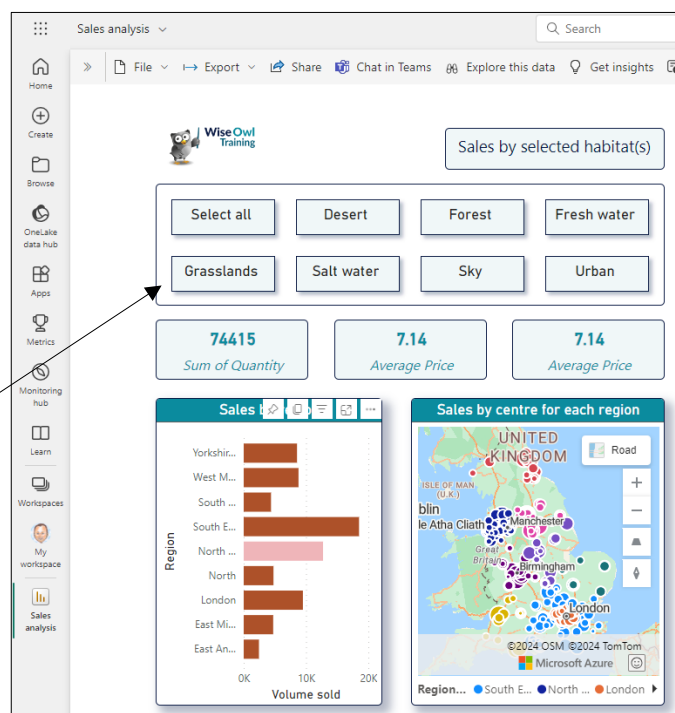
This report contains an image, a text box and 6 *visuals* (a slicer, 3 cards, a bar chart and a map).

The report is based on tables which we've imported into a *model*:



You can then publish these reports to the Power BI Service, allowing anyone who has a paid Power BI account to view them:

The same report as seen in Power BI Service through a browser.



1.2 Installing and Updating Power BI

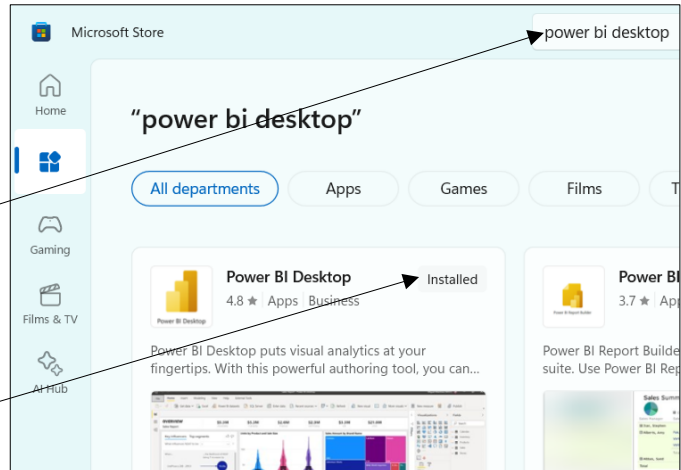
There are two ways to install Power BI, depending on whether you want to get automatic monthly updates.

From Microsoft Store

The easiest way to install Power BI is from the Microsoft Store:

- Type in **Power BI Desktop** in the *Microsoft Store* search bar.

- Choose to install the **Power BI Desktop** application (although in this case it's already installed on this user's machine).



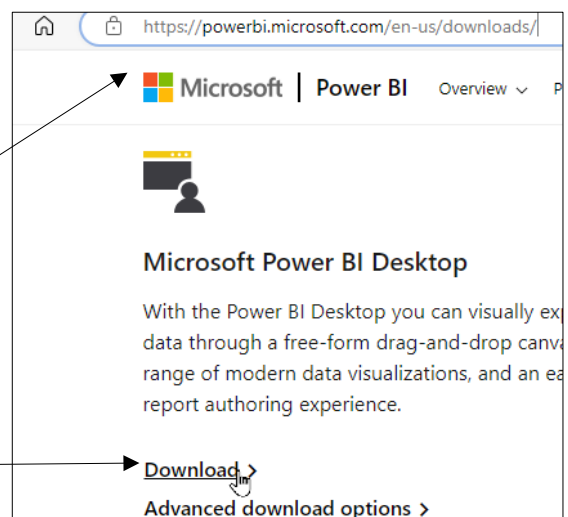
Every month Power BI will update automatically as Microsoft release new features. The best way to keep track of what these new features entail is to subscribe to the Wise Owl newsletter. This goes out at the start of each month and (among other things) summarises and explains any new updates to Power BI.

Installing without Automatic Updates

If you want to control when monthly Power BI desktop updates are installed on your computer, choose this installation option instead:

- Googling **install power bi desktop** should lead you to this page in your browser.

- Click to download the latest version of Power BI Desktop (it'll be up to you to update this manually to incorporate changes).



CHAPTER 2 - GETTING STARTED

2.1 Getting Started in Power BI Desktop

This chapter describes the basic workflow you'll use to build a report in Power BI Desktop:

Stage	Details
<i>Loading and transforming data</i>	Loading one or more tables from various data sources, cleansing the data and linking the tables together if necessary.
<i>Creating a report</i>	Using the data that you've loaded to create a report, including visuals like charts.
<i>Publishing this</i>	Publishing the results to your report server (usually Microsoft's Power BI Service) so that other people can view your reports.

You'll find much more detail on the ideas mentioned in this chapter in later parts of this courseware.

Example for this Chapter

To demonstrate the basic process of building a report, we'll import a table of data from a webpage and create and publish a report based upon this:

AT A GLANCE SNOW REPORTS

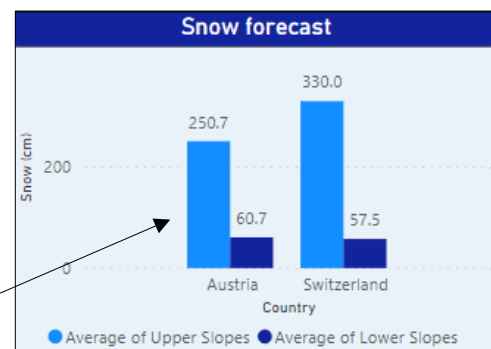
Sort By: Most Popular Resorts | [Uppers Slopes](#) | [Lower Slopes](#) | [Last Snowfall](#) | [A-Z](#) | [Country](#)

Resort	Country	Upper Slopes	Lower Slopes	Last Snowfall
St Anton snow reports	Austria	335cm	70cm	12cm
Ischgl snow reports	Austria	160cm	80cm	4cm
Obergurgl snow reports	Austria	159cm	85cm	1cm
Lech snow reports	Austria	335cm	70cm	12cm

At the time of writing these are the snow conditions at selected resorts courtesy of <https://www.igluski.com/snow-reports>. We'll *transform* the data to tidy it up (for example, we can remove columns we don't need).

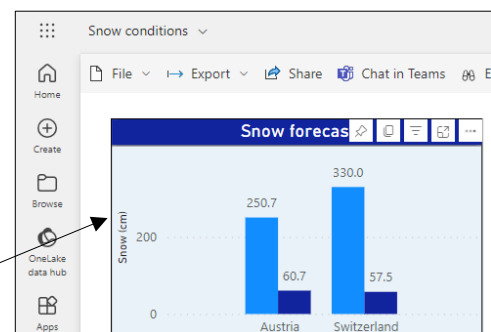
We'll then present this data using *visuals* such as this chart:

We can use the imported, cleaned data to create a variety of visuals, such as this chart.



Finally we will publish this report to the Power BI Service, so that anyone in your organisation can see it:

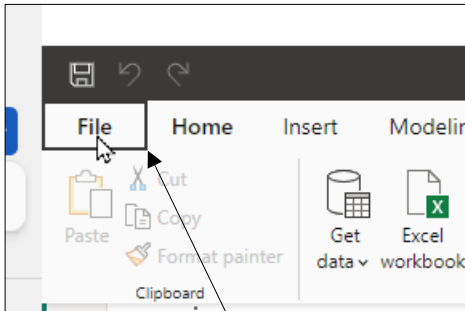
The final report published to Power BI Service, and viewed through your browser.



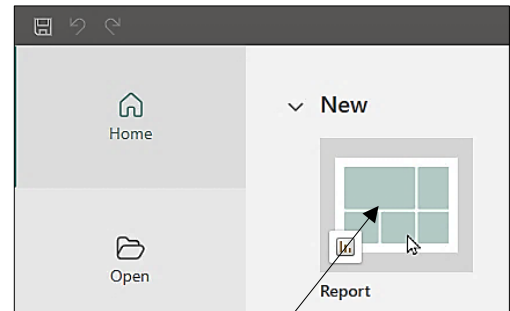
2.2 Working with Files

Creating New Files

You can create a new report in Power BI Desktop in the following ways:



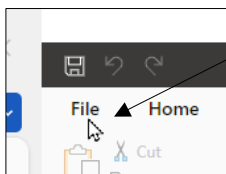
- a) If you already have Power BI Desktop open, select the **File** menu.



- b) Click on this icon to create a new report.

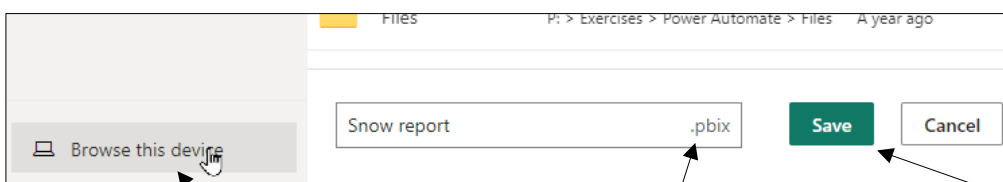
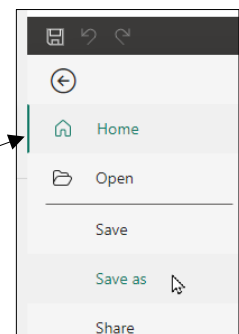
Opening and Saving Files

You can open and save files using options in the **File** menu:



- a) From the Power BI Desktop menu choose the **File** menu.

- b) Choose one of these menu items to open or save a report (the dialog box which appears is similar whichever you choose).



- c) Click on this button to find the folder which contains (or will contain) your report.

- d) Files that you save in Power BI Desktop will have a **pbix** extension.

- e) Click on this button to open the report you've chosen or to save this report



Every time you open a Power BI Desktop report a new instance of the application will launch, leaving the current report you're working on unaffected. To close a report you must close down the Power BI Desktop application containing it (there is no option to close a report but still leave Power BI Desktop running).

2.3 Views in Power BI Desktop

The most important components of the *Power BI Desktop* screen are as follows:

These tools allow you to switch between the 3 main views in Power BI Desktop: **Report** view, **Table** view and **Model** view.

This is the Power BI Desktop menu and ribbon.

You can use the *Pane Switcher* to change what to look at. The two main views are **Data** and **Format**, as explained below.

These tools allow you to switch between designing reports for viewing on desktop computers or mobile phones.

You can use the slider to zoom in and out, although you may find it easier to hold down the **Ctrl** key and use your mouse wheel instead.

Switching Panes

You can use the icons on the right-hand side of your Power BI screen to choose what to show:

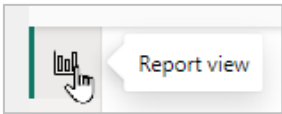
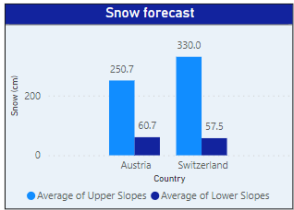

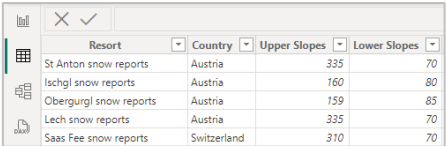
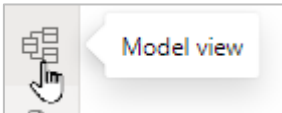
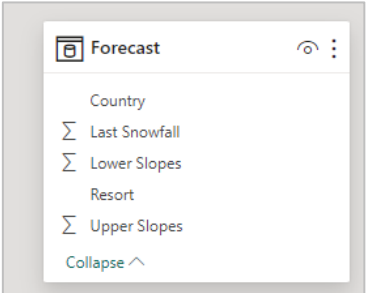
Click on this icon to see the data tables in your model ...

... or this icon to see the format properties of the thing you currently have selected (in this case a chart visual).

You can also use these tools on the **View** tab of the Power BI Desktop ribbon to choose what you want to view.

Report, Table and Model View

You can switch between the three views of a report using the tools on the left of the screen:

View	Icon	What it shows	Example view
Report		The report that you're creating, consisting of visuals and shapes.	
Table		The tables of data that you've loaded into your model (you can see one table at a time in this view).	
Model		The links between the tables in your model, called <i>relationships</i> in Power BI Desktop.	



The 4th icon – if present – allows you to create queries in DAX to interrogate the data upon which your report is based, but this is definitely not something to consider in this courseware chapter!

2.4 Getting Data

The first stage in building a report is to find some data!

a) From the ribbon, choose **Home | Get Data** then choose a type of data source. Here we're choosing a **Web** source.

b) Each type of data source requires different information to allow your report to connect to it. For a web source you need to enter the URL of the page and then click **OK**. You may also be asked to enter credentials if the website requires some.

c) Tick which table you want to import from this page (the best way to see what each looks like is to click on it).

d) Click on this button to load the data into your model.

The 'From Web' configuration page shows the URL: `https://www.igluski.com/snow-reports`. The 'Table View' shows a table with the following data:

Column1	Column2	Column3
Resort	Country	Upper Slopes
St Anton snow reports	Austria	335cm
Ischgl snow reports	Austria	160cm
Obergurgl snow reports	Austria	159cm
Lech snow reports	Austria	335cm
Saas Fee snow reports	Switzerland	310cm
Flims Laax snow reports	Switzerland	350cm
Zurs am Ariberg snow reports	Austria	335cm
Solden snow reports	Austria	283cm
Zell am See snow reports	Austria	148cm

You can optionally rename a table after importing it into your report:

a) Click on this icon to show the **Data** pane.

b) Choose **Rename** from the menu which appears.

c) Enter a new name for your table and press **Enter**.

The 'Data' pane shows a table named 'Forecasts' with columns 'Column1' and 'Column2'. The context menu is open, showing options like 'Select', 'New measure', 'New column', 'New quick measure', 'Refresh data', 'Edit query', 'Incremental refresh', 'Manage aggregations', 'Rename', and 'Delete from model'.

2.5 Transforming Data

You'll often need to make changes to the data you have imported so that it can be presented easily in visuals. This process is known as *transforming* data.

Column1	Column2	Column3	Column4	Column5
Resort	Country	Upper Slopes	Lower Slopes	Last Snowfall
St Anton snow reports	Austria	335cm	70cm	12cm
Ischgl snow reports	Austria	160cm	80cm	4cm
Obergurgl snow reports	Austria	159cm	85cm	1cm
Lech snow reports	Austria	335cm	70cm	12cm
Saas Fee snow reports	Switzerland	310cm	70cm	1cm
Films Laax snow reports	Switzerland	350cm	45cm	1cm
Zurs am Arlberg snow reports	Austria	335cm	70cm	12cm
Sölden snow reports	Austria	283cm	30cm	1cm
Zell am See snow reports	Austria	148cm	20cm	1cm



We will change the column headings, turn some column into numbers and remove the final column.

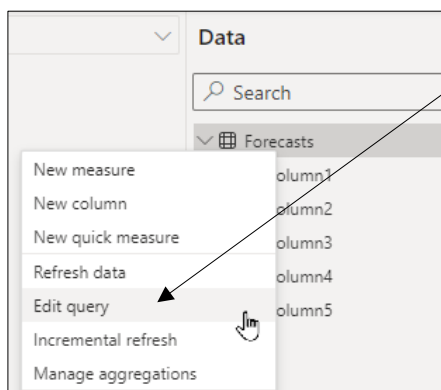
1	2	3	4
Resort	Country	Upper Slopes	Lower Slopes
1 St Anton snow reports	Austria	335	70
2 Ischgl snow reports	Austria	160	80
3 Obergurgl snow reports	Austria	159	85
4 Lech snow reports	Austria	335	70
5 Saas Fee snow reports	Switzerland	310	70
6 Films Laax snow reports	Switzerland	350	45
7 Zurs am Arlberg snow reports	Austria	335	70
8 Sölden snow reports	Austria	283	30
9 Zell am See snow reports	Austria	148	20



As with everything else in this chapter, we will go into this topic in much more detail later in this courseware.

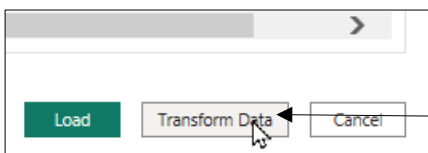
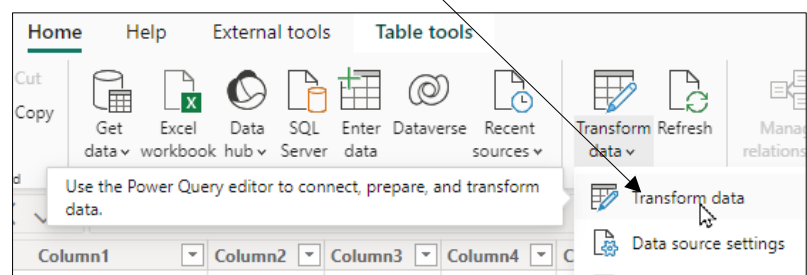
Editing Queries / Transforming Data

Each table that you import into a report generates a *query* which tells Power BI Desktop which data to get (and how to get it). You can edit these queries in (at least) 3 different ways:



You can right-click on a table in the **Fields** pane and choose **Edit query...**

...or you can choose this option from the **Home** tab of the ribbon (although it says it's doing something different, transforming data and editing a query are actually the same thing!).



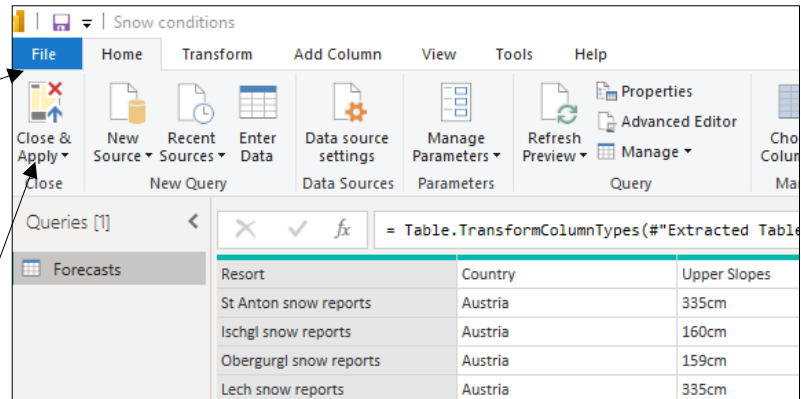
Alternatively, you could click on this button at the point at which you're first loading data to go directly into the Power BI Query Editor.

The Power BI Query Editor

Choosing to edit a query as described above opens the *Power Query Editor* tool within Power BI Desktop.

Although you're still working in the same Power BI Desktop file, the Power Query Editor has a different ribbon with options related to modifying data.

When you have finished cleaning your data click **Close & Apply** to close the Power Query Editor.



*This program to edit Power BI queries has gone by many names in the past! This courseware will call it **Query Editor**, although this name seems to have been abandoned by Microsoft. Little known fact: everything that you can do using Query Editor in Power BI Desktop you can also do when getting data in Excel.*

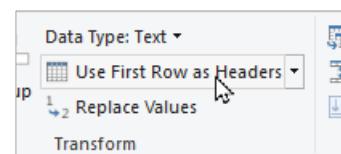
Promoting Row Headers

For our example the first thing you need to do is to make the first row your table headers:

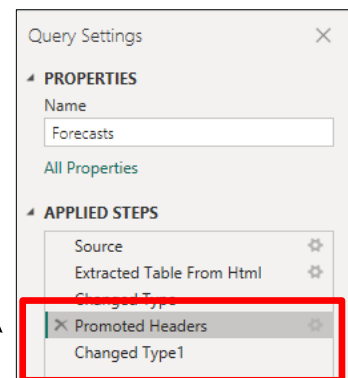
	Column1	Column2	Column3
1	Resort	Country	Upper Slopes
2	St Anton snow reports	Austria	335cm
3	Ischgl snow reports	Austria	160cm

	Resort	Country	Upper Slopes
1	St Anton snow reports	Austria	335cm
2	Ischgl snow reports	Austria	160cm

- a) To tell Power BI Desktop to use the first row of the table as column headers, click on this tool on the **Home** tab of the Query Editor ribbon:

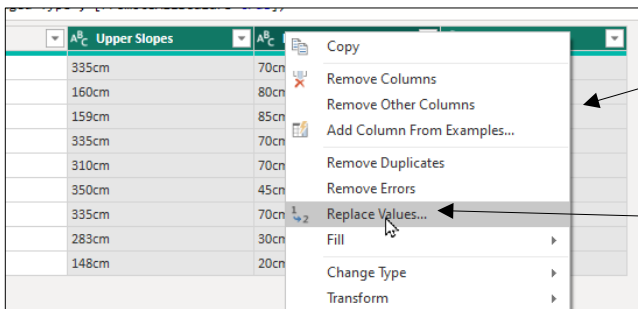


- b) Query Editor will add two steps: one to promote your row headers (as requested), and then another to change the data types of the columns following this step. Query Editor will often insert silent additional steps like this to second-guess your intentions, and (to be fair) nearly always gets these right.



Replacing Values

To allow us to average snowfalls for our data we need to remove the **cm** suffices then convert the resulting data to integer numbers:



a) Select the first column whose **cm** suffices you want to remove, then hold down the **Shift** key and select the last one (this is the easiest way to select multiple columns in Query Editor).

b) Right-click on the selected columns and choose to replace values.

Replace Values

Replace one value with another in the selected columns.

Value To Find

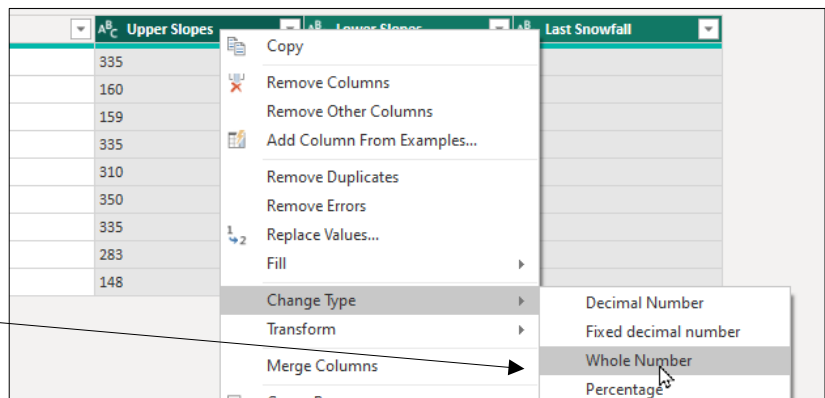
Replace With

c) Choose to replace the text **cm** with nothing, then select **OK**.

Changing Data Types

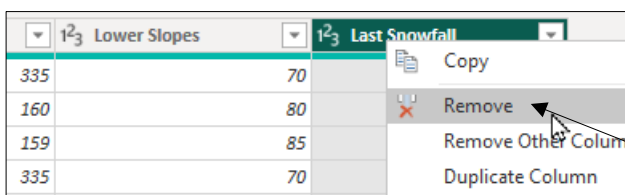
You can now change the data types of the 3 columns you have selected:

Right-click on the 3 columns and choose to change their data types to **Whole Number** (note that this would have generated errors if we had done this earlier).



Removing Columns

Finally, we're not interested in the last snowfall depth, so we'll remove this column.



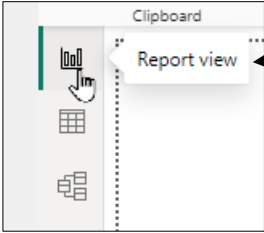
Right-click on the **Last Snowfall** column and remove it from your query.

2.6 Creating Visuals

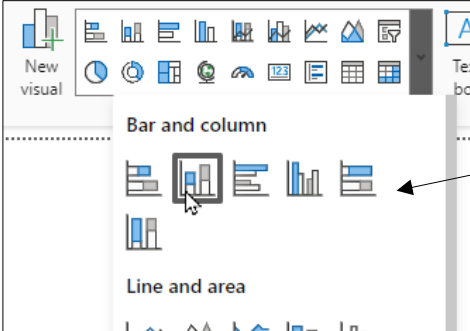
Visuals are the tables, charts or other gizmos which display the data in your report. There are many types of visual (you'll learn a lot more about them in later chapters of this courseware).

Inserting a Visual

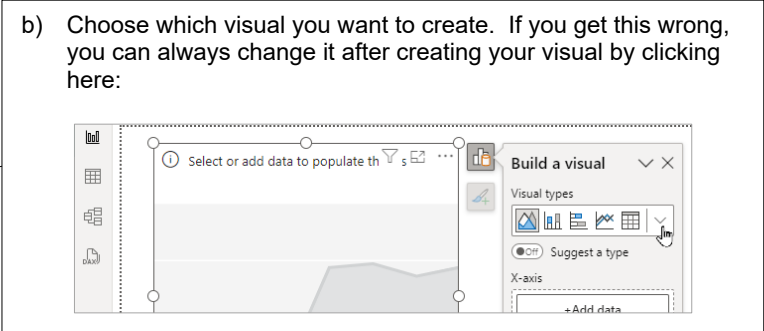
Probably the easiest way to add a visual to a report is as follows:



a) Make sure that you're in **Report** view, otherwise you won't be able to add visuals!



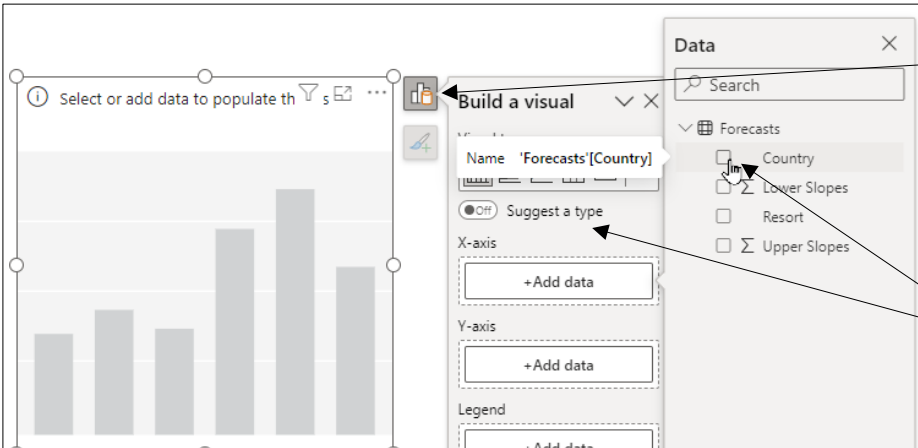
b) Click on the side bar to the right of the visuals pane (this appears on both the **Home** tab and the **Insert** tab of the ribbon).



b) Choose which visual you want to create. If you get this wrong, you can always change it after creating your visual by clicking here:

Assigning Grouping Fields to a Visual

Once you have inserted a visual you can begin assigning fields to it:

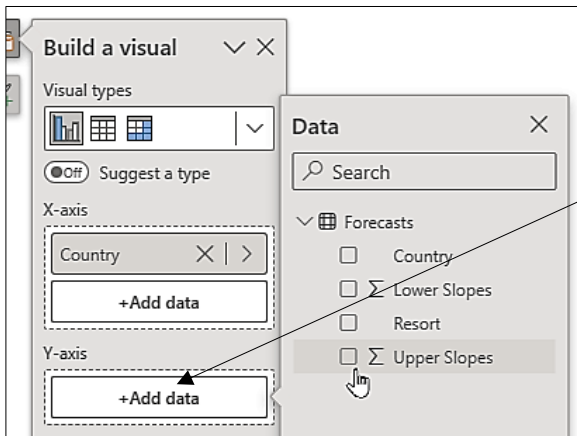


The easiest way to assign fields to a visual is to click on this tool.

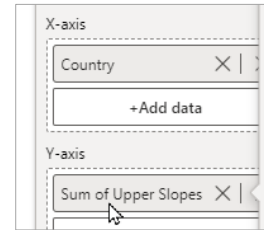
You can then click on each part of a chart (here we're saying what will appear on the horizontal axis of this column chart) then tick the field you want to include.

Assigning Numerical Fields

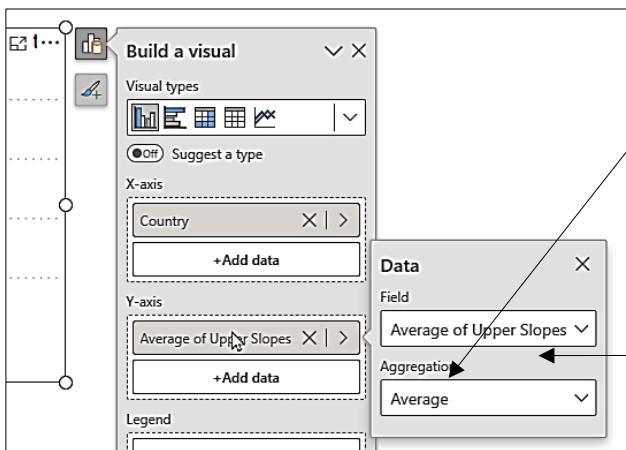
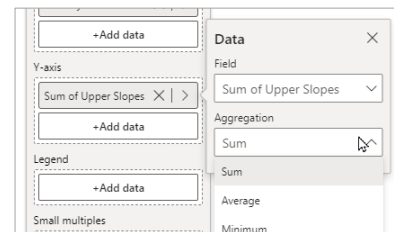
You can assign numerical fields in the same way, then change how you want to aggregate them:



- a) Click on the **Y axis** box the field well and choose to show the **Upper Slopess** snow depth to get this:



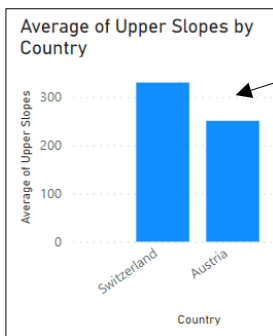
- b) Click on the field you've added and change it:



- c) Once you've assigned a numerical field to a chart you can click on it to say how you want to aggregate it (here we've changed from summing the upper slopes' snow depth for each country – which would be fairly meaningless – to averaging it).

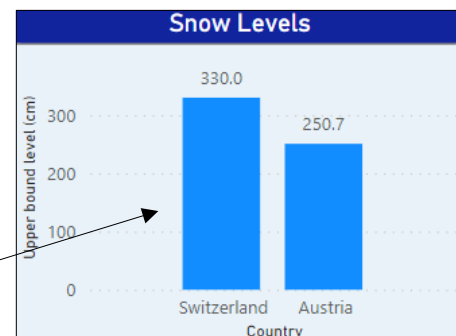
2.7 Three Ways to Format Visuals

Much of your time in Power BI Desktop will probably be spent applying formatting like this:



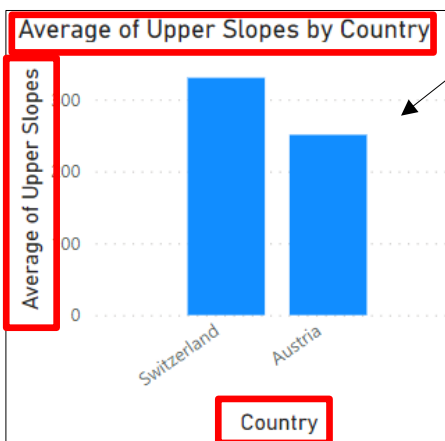
The chart as it initially appears – the title is hard to read and doesn't stand out, and it could do with a bit of oomph.

A chart which has been formatted within an inch of its life (including the addition of data labels showing the average upper bound snow level by country).



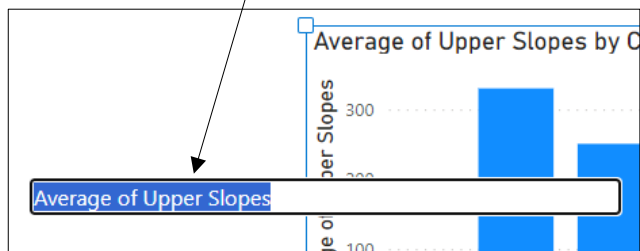
In Situ Selection

There are a few parts of a chart that you can edit on the chart itself:



The parts of the chart you can edit directly are shown in red boxes.

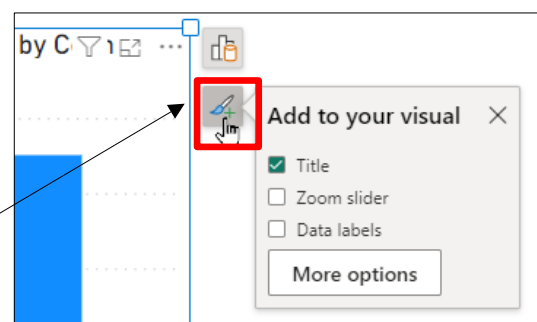
When you double-click on any of these with the chart selected you will be able to change the text displayed.



Changing what's on your Chart

You can choose to add or remove some parts of your chart using the following icon:

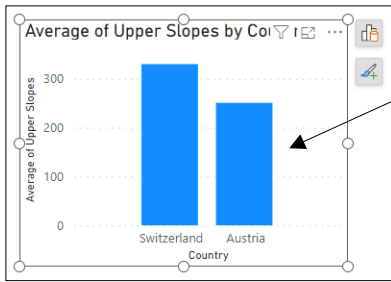
Click on this icon to add or remove certain chart components (here we can add or remove the title, data labels or a slider).



*The **More options** button is less useful than you might think: it just takes you to the **Format** pane on the right-hand side of Power BI Desktop.*

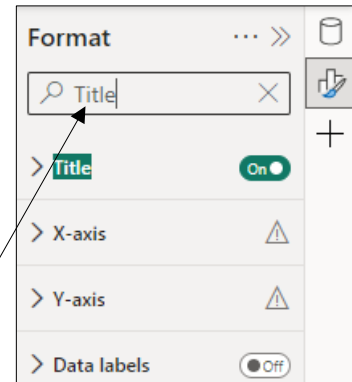
The Format Pane

You'll spend much of your time in Power BI Desktop using the **Format** pane:

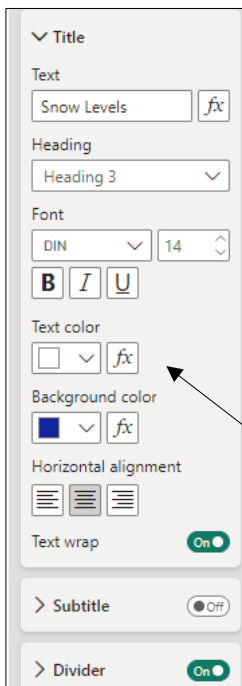


a) Select the visual you want to format (otherwise you'll see the formatting properties of the page to which it belongs instead).

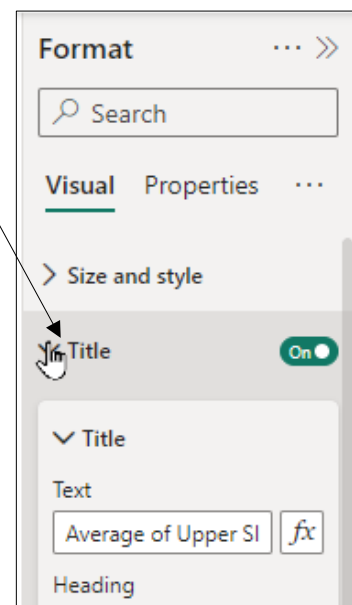
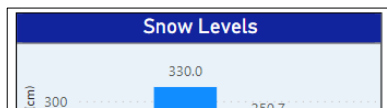
b) Optionally, reduce the number of properties displayed by typing in part of the name of the one you want to change (here we've typed **Title** in the search box).



c) Expand a card to show its range of formatting options, and make changes.



d) Some of the changes made to change the title to this:



*As a short-cut, double-click on a visual to select any part of it that you want to format; the relevant card will automatically then be selected in the **Format** pane.*

2.8 Publishing your Report

When you've finished your report you will probably want to share it!

a) Check that you're signed in to a Power BI account.

b) Click on this **Publish** button on the **Home** tab of the Power BI ribbon.

c) If you have unsaved changes you will be asked at this point to save them (you can't publish a report which contains unsaved changes).

Microsoft Power BI Desktop

Do you want to save your changes?

Save

d) Choose to publish to the default **My workspace** (see hint below for more on this).

Publish to Power BI

Select a destination

Search

My workspace

Select

Publishing to Power BI

✓ Success!

[Open 'Snow conditions.pbix' in Power BI](#)

[Get Quick Insights](#)

Did you know?
You can create a portrait view of your report, tailored for mobile phones. On the **View** tab, select **Mobile Layout**. [Learn more](#)

Got it

e) Click on this link to see your report in Power BI Service on the Internet (you may be asked to log in to your account again at this point).

Snow conditions

File Export Share Chat in Teams Explore

Home Create Browse OneLake data hub

Snow forecast

Snow (cm)	Forecast
2K	1,755.0
1K	660.0

f) Your report as it will appear to the world (provided of course that they have the right security level and licence ...).



A (much) later chapter in this courseware will cover publishing in more detail, including an explanation of workspaces (and why you might want to create them), how to create dashboards and much more besides.

Blank lined area for writing.



Handwriting practice lines consisting of 24 horizontal dotted lines.



Handwriting practice lines consisting of 20 horizontal dotted lines.



Blank lined paper for writing.



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Training

Blank lined paper for writing.



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Blank lined paper for writing.



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Training

What we do!

		Basic training	Advanced training	Systems / consultancy
Office	Microsoft Excel			
	VBA macros			
	Office Scripts			
	Microsoft Access			
Power BI, etc	Power BI and DAX			
	Power Apps			
	Power Automate (both)			
SQL Server	SQL			
	Reporting Services			
	Report Builder			
	Integration Services			
	Analysis Services			
Coding	Visual C#			
	VB programming			
	MySQL			
	Python			



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