# Fast-track Power BI

## Sample manual - first two chapters

Wise Owl Training

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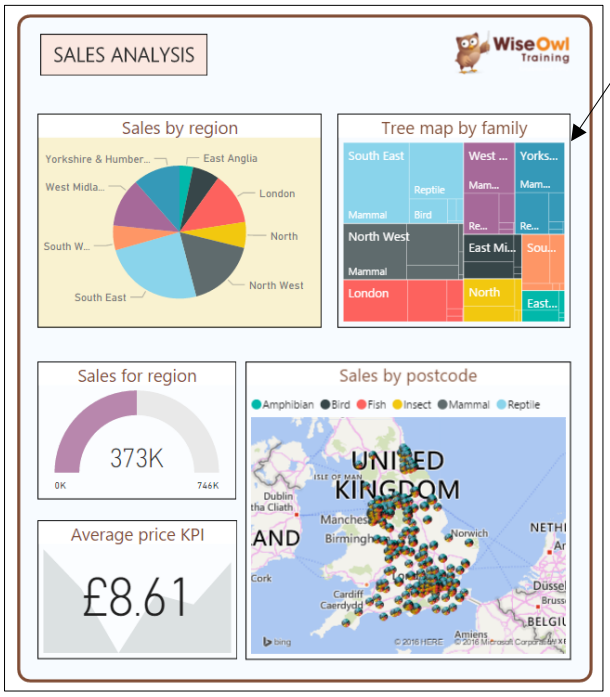
# CHAPTER 1 - POWER BI BASICS

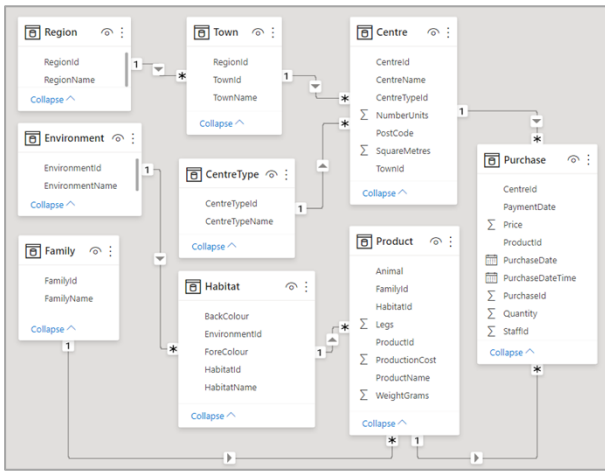
## 1.1 What is Power BI Desktop?

*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:



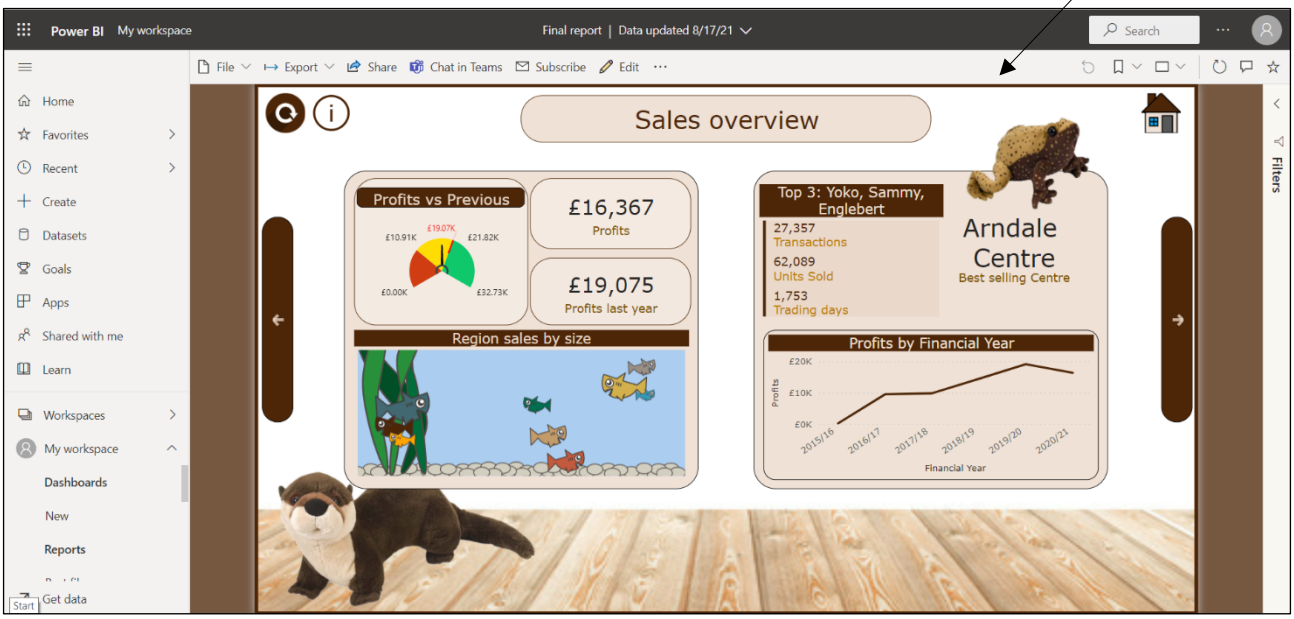

This report contains five *visualisations* (a pie chart, a tree map, a gauge, a map and a KPI).

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:

Another report as seen in Power BI Service through a browser.

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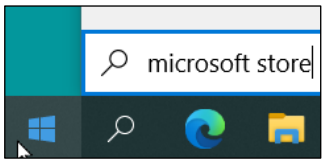
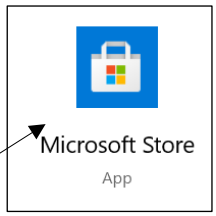
## 1.2 Installing and Updating Power BI

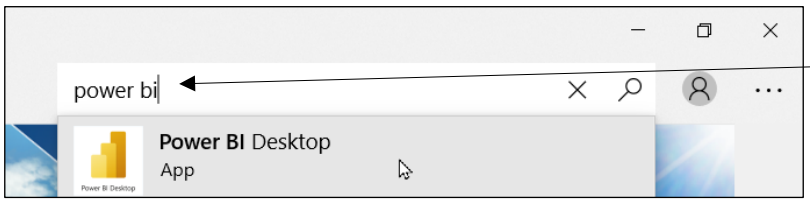
The easiest way to install Power BI is from the Microsoft Store:



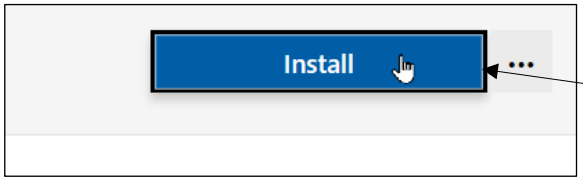

a) Type in **Microsoft Store** into the Cortana search bar.

b) Run the Windows program to go to the MS Store.

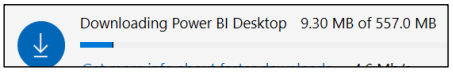


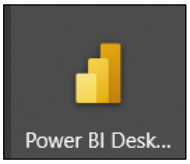

c) Type in **power bi** in the search box at the top of Microsoft Store, and choose Power BI Desktop.



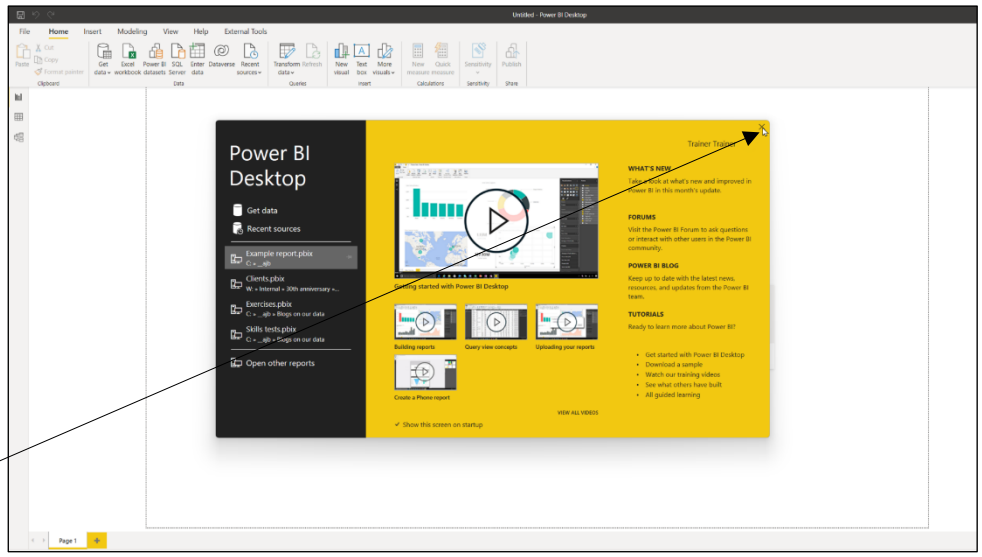

d) Click on this button to install Power BI Desktop. You'll see something like this:




You'll then be able to run Power BI Desktop like any other Windows program:




The icon you'll grow to know and love!




Click on this cross to close the start screen.

**Wise Owl's Hint**

*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.*

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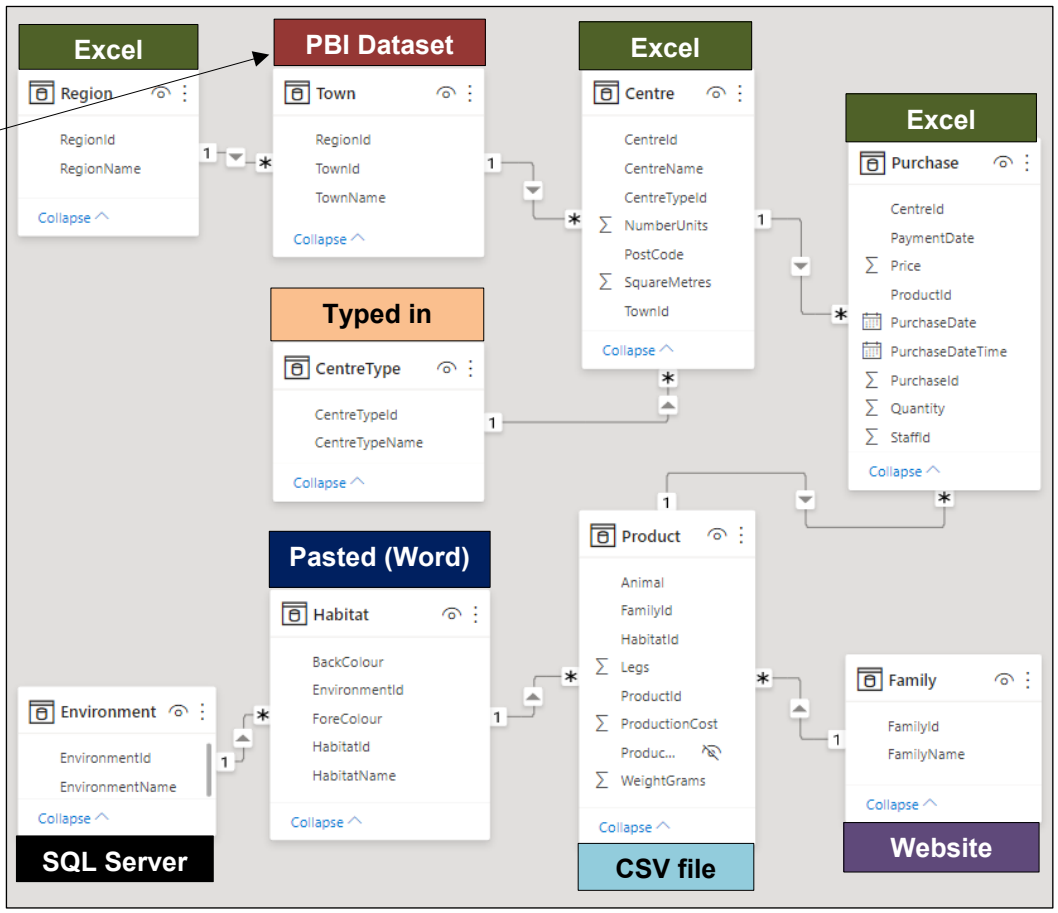
# CHAPTER 2 - IMPORTING DATA

## 2.1 Our Example

Our example is based on a relational database which keeps track of sales of soft toys. The diagram below shows which type of data source we'll use to import each table:

You can't actually mix live Power BI datasets with other data sources, but this fact would run our diagram!




The tables in the model are related using a system of ID columns. For example, this is what the habitat and product tables will look like after we import them into our model:

**Pokyo** the penguin is an item in the product table and has a **HabitatId** number **4** and a **FamilyId** number **3**.

| ProductId | ProductName | Animal | HabitatId | Legs | FamilyId | WeightGrams |
|---|---|---|---|---|---|---|
| 1 | Sammy | Snake | 1 | 0 | 1 | 950 |
| 2 | Pokyo | Penguin | 4 | 2 | 3 | 850 |
| 3 | Fenella | Frog | 3 | 4 | 4 | 400 |

| HabitatId | HabitatName | EnvironmentId | BackColo |
|---|---|---|---|
| 1 | Grasslands | 1 | Light gree |
| 2 | Forest | 1 | Dark gree |
| 3 | Fresh water | 3 | LightBlue |
| 4 | Salt water | 3 | #78aaf5 |
| 5 | Desert | 1 | #d6a740 |
| 6 | Urban | 1 | #222 |
| 7 | Sky | 2 | #0a66f0 |

Looking up the **HabitatId** in the habitat table tells us that **Pokyo** lives in **Salt water**.

Looking up the **FamilyId** in the family table tells us that **Pokyo** is a **Bird**.

| FamilyId | FamilyName |
|---|---|
| 1 | Reptile |
| 2 | Fish |
| 3 | Bird |
| 4 | Amphibian |
| 5 | Mammal |
| 6 | Insect |

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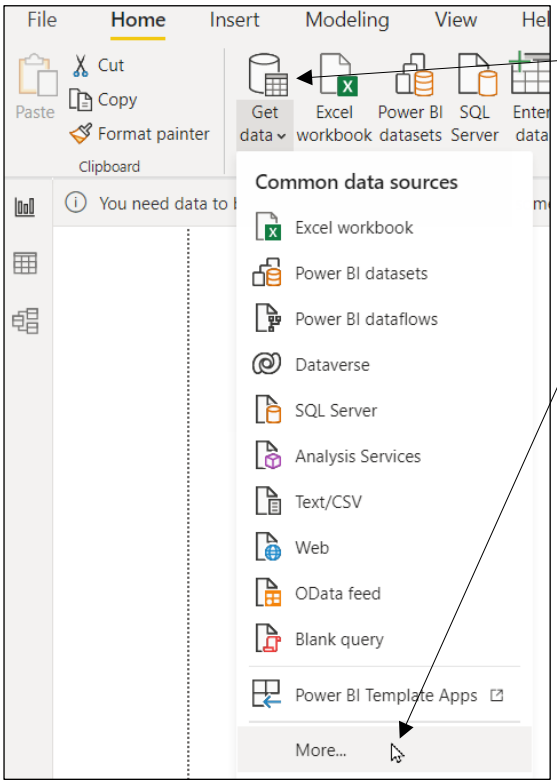
## 2.2 Importing from Different Sources

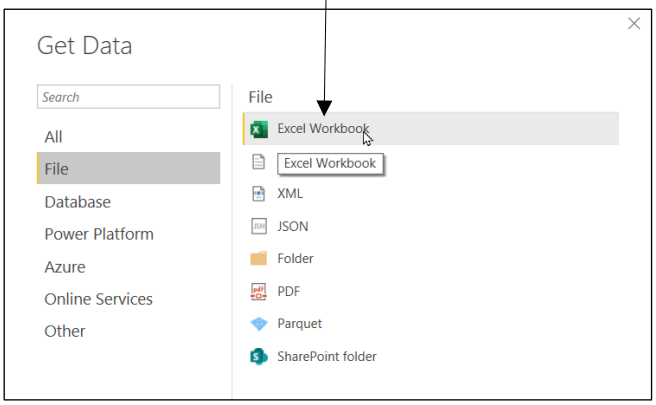
This section shows how to import data into a report from a variety of common data source types. Regardless of which data source type you're using, you can begin the import process as follows:




a) From the ribbon choose **Home | Get Data**. You can also click the top half of the **Get Data** tool to open the dialog box shown below.

b) Pick a data source type from the **Common data sources** list, or click **More…** to see more choices.

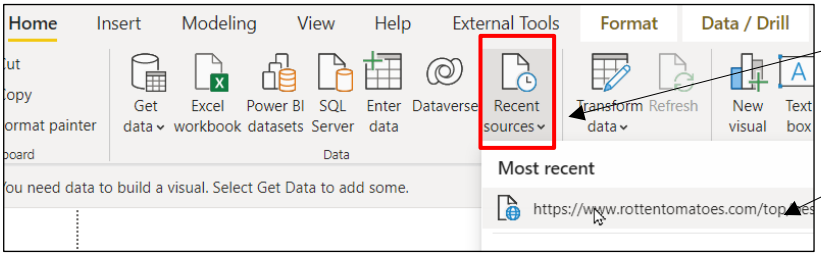
c) If you clicked **More…** you'll have a greater choice of data source types. Browse through the list and then double-click when you've found the one you need.



*What happens next depends on which data source type you've chosen but it inevitably involves launching some type of wizard which will help you import your data.*

### Re-Using a Data Source

You can quickly reuse a recent data source as shown below:




a) From the ribbon choose **Home | Recent Sources**.

b) Pick from the list of databases, workbooks, websites, etc from which you've already imported data.

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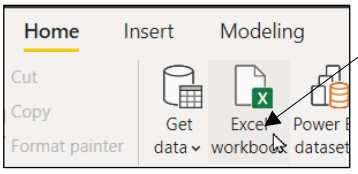
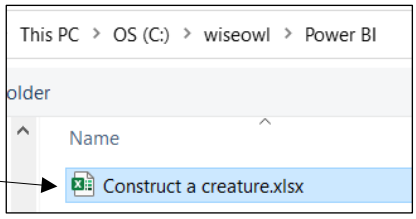
## 2.3 Importing from Excel

To start importing from an Excel workbook, use the short-cut:




Power BI gives you a special Excel tool because it's such a popular choice.

Double-click on a workbook containing one or more worksheets or named ranges that you want to impot.

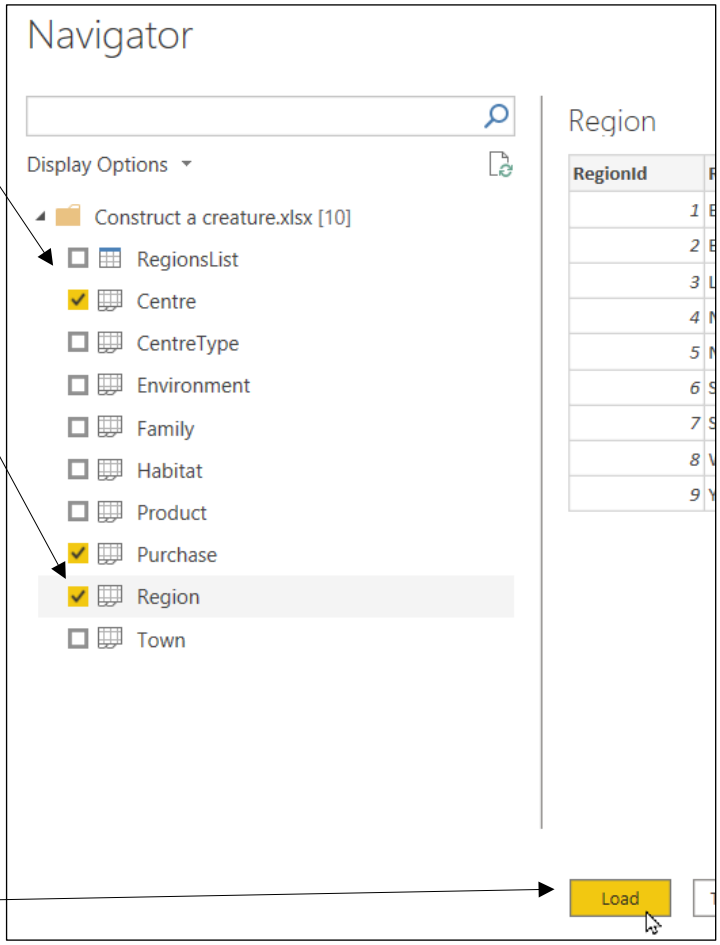



The dialog box which appears lists the contents of the workbook you have selected. You can choose which parts of the workbook you want to import as shown below:

The left of the dialog box will show a list of worksheets and named ranges in the file. Out of the first two items listed, the first is a named range in Excel, and the second is a worksheet (the icons are slightly different):

Tick the box next to the name of any item you want to import. Here we've chosen to import the **Centre**, **Purchase** and **Region** worksheets.

When you've selected all the items you want to import, click **Load** to import them.



*If you get a message saying that* Power BI Desktop *can't import data because a 64-bit driver isn't installed, make your life easier by saving all your Excel workbooks with* ***xls*** *and not* ***xlsx*** *extensions (it's by far the quickest solution, although most users won't see this problem).*

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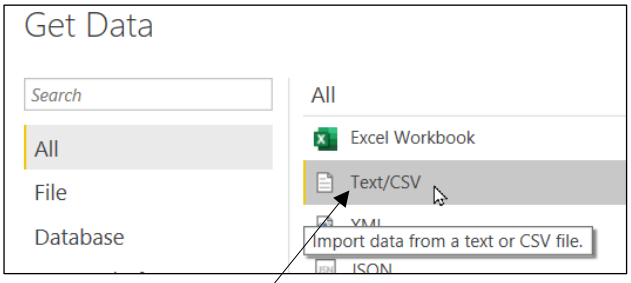
## 2.4 Importing CSV or Text Files

You can import from CSV files as well as a variety of other text file types.

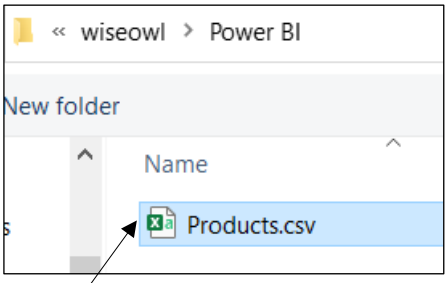
**CSV** stands for **Comma Separated Values**. The value in one column is separated from the next with a comma. Our example file also includes a row of column headers.

```
ProductId,ProductName,Animal,HabitatId,Legs,FamilyId,Wei
1,Sammy,Snake,1,0,1,950,7.19
2,Pokyo,Penguin,4,2,3,850,4.5
3,Fenella,Frog,3,4,4,400,10.79
4,Layla,Lemur,2,2,5,550,4.28
```

To begin importing from a text file:




Choose to get data from a **Text/CSV** file …



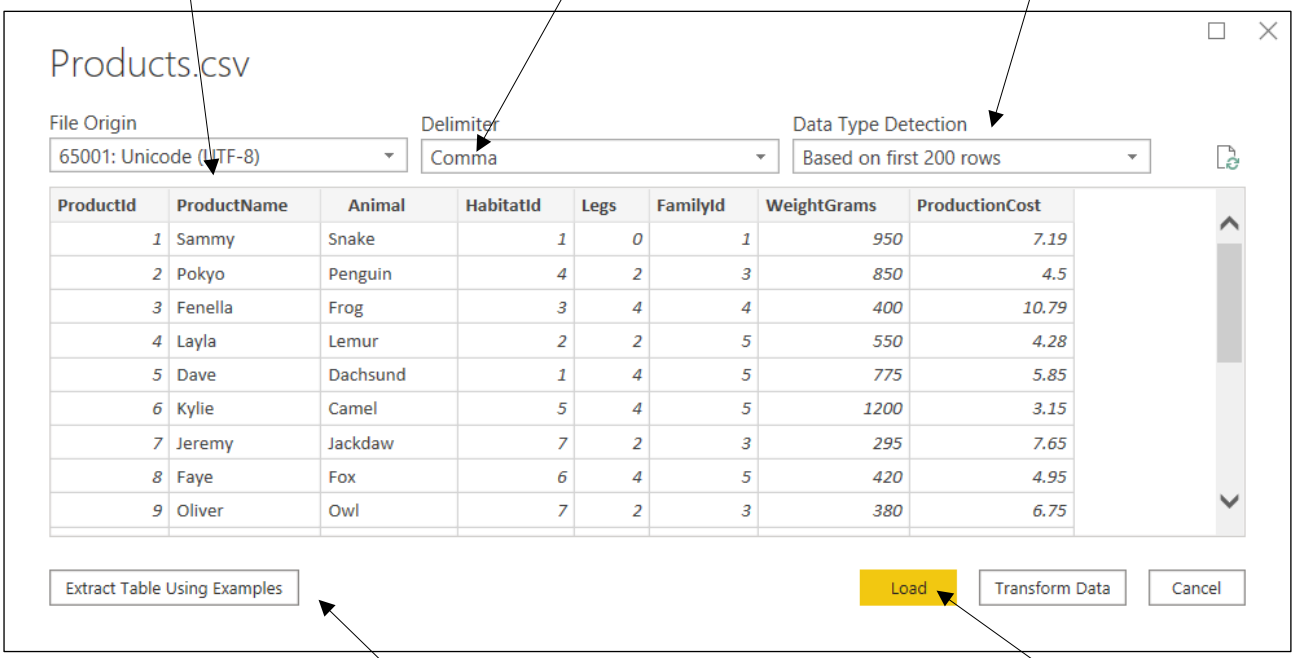

… then browse for and double-click the file you want to import.

You can then choose exactly how the text file is configured using the dialog box which appears:

The preview of your data is a good way to check if you've selected the correct options.

If Power BI Desktop hasn't picked the correct delimiter, you can choose a new one.

Power BI Desktop attempts to work out the data type of each column using a sample of rows. You can set the sample size here.




| ProductId | ProductName | Animal | HabitatId | Legs | FamilyId | WeightGrams | ProductionCost |
|---|---|---|---|---|---|---|---|
| 1 | Sammy | Snake | 1 | 0 | 1 | 950 | 7.19 |
| 2 | Pokyo | Penguin | 4 | 2 | 3 | 850 | 4.5 |
| 3 | Fenella | Frog | 3 | 4 | 4 | 400 | 10.79 |
| 4 | Layla | Lemur | 2 | 2 | 5 | 550 | 4.28 |
| 5 | Dave | Dachsund | 1 | 4 | 5 | 775 | 5.85 |
| 6 | Kylie | Camel | 5 | 4 | 5 | 1200 | 3.15 |
| 7 | Jeremy | Jackdaw | 7 | 2 | 3 | 295 | 7.65 |
| 8 | Faye | Fox | 6 | 4 | 5 | 420 | 4.95 |
| 9 | Oliver | Owl | 7 | 2 | 3 | 380 | 6.75 |

Optionally you can click on this button to train Power BI on which columns you want to import, although it's usually easier to import everything then remove from the query the columns you don't want.

When you've finished configuring the text file, click the **Load** button to import it into your Power BI report.

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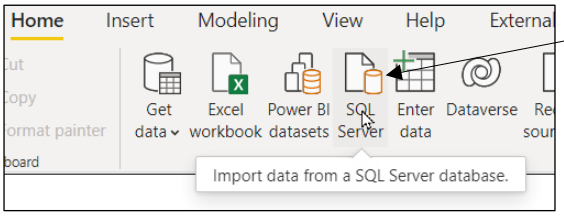
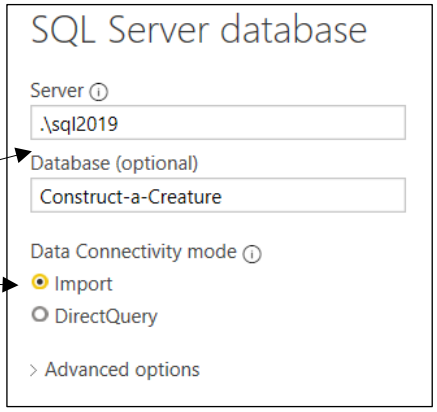
## 2.5 Importing from SQL Server

You can import data from a SQL Server database as shown in the diagram below:

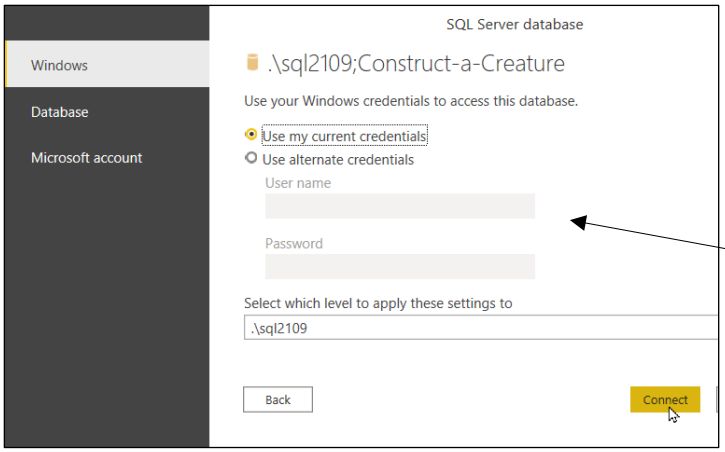



a) Like Excel, SQL Server has a dedicated import tool!

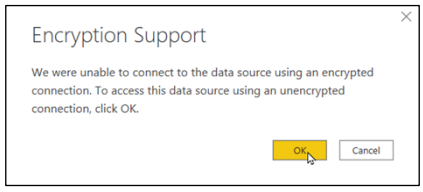



b) Enter a server name and, optionally, the name of a database.

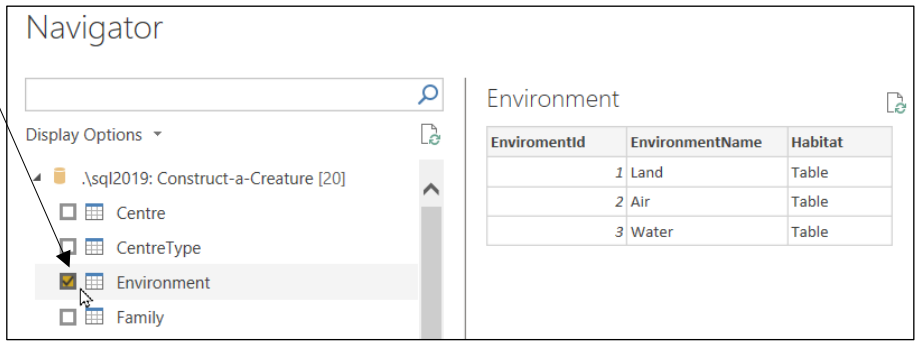
c) Choose to **Import** the data and then click **OK** (see the hint below for more on what **DirectQuery** means).




d) Enter your credentials to connect to the server you have chosen. Click **Connect** when you've done so - you may then have to confirm you're happy to use an unencrypted connection:




e) In the next dialog box you can pick from a list of tables to import. Here we've chosen to import the **Environment** table.



*If you're wondering,* DirectQuery *means you don't import the data into your model: you just link to it. On the plus side this means your visualisations are always bang up to date, but on the downside, they may run more slowly, and there are numerous limitations (for example, you can only use a few types of data source and you can't use something called calculated columns).*

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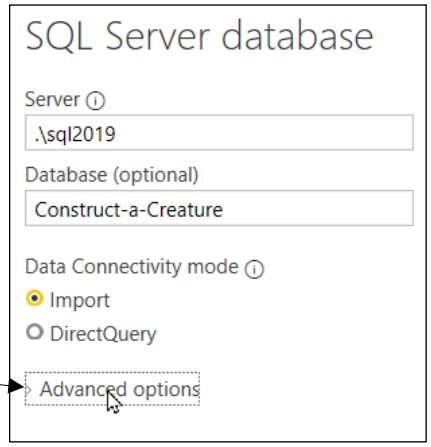
## Using Queries and Stored Procedures

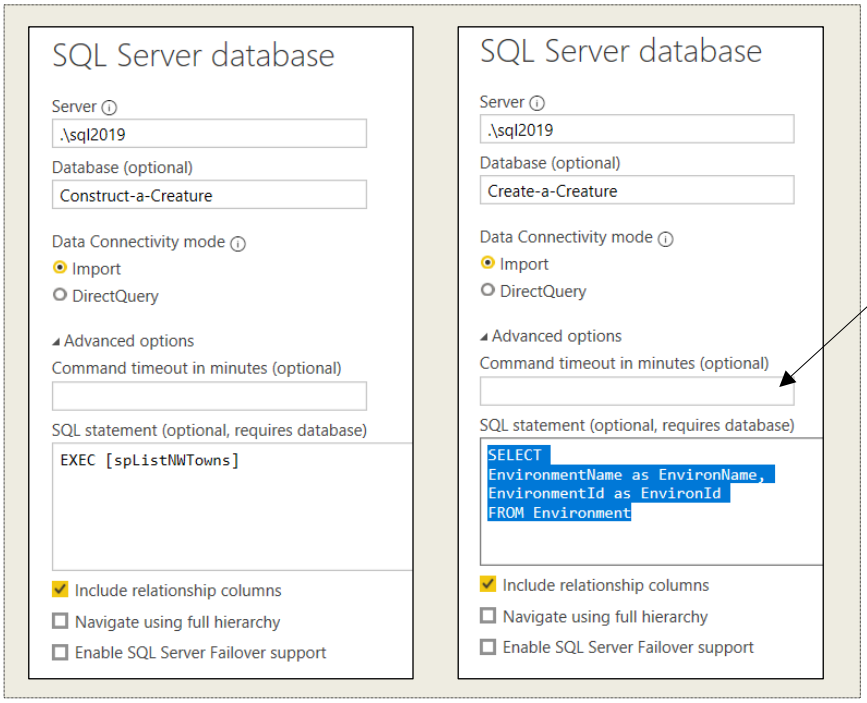
Rather than choosing to import from a list of tables, you can write a query to return your data. This is more complicated but provides much more control over which data you get.

```
use [Construct-a-Creature];
GO

CREATE PROC spListNWTowns
AS

-- list regions and towns
SELECT
    t.TownName AS Town,
    t.TownId
FROM
    Region as r
    JOIN Town as t ON
        r.RegionId = t.RegionId
WHERE
    R.RegionName = 'North West'
```

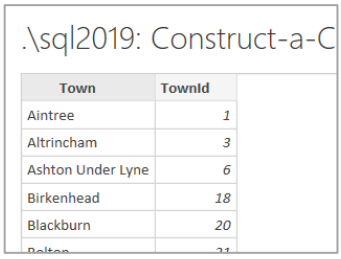
a) It's much easier to test your query in SQL Server Management Studio than it is to type it into Power BI! When your query or stored procedure is working, copy the query text or the name of the stored procedure to the clipboard.

b) While loading SQL Server data, choose to show advanced options.




c) Choose either to execute a stored procedure (left) or run a query right. Note that the square brackets round the stored procedure name appear to be needed! Either option will then let you load your data:




| Town | TownId |
|---|---|
| Aintree | 1 |
| Altrincham | 3 |
| Ashton Under Lyne | 6 |
| Birkenhead | 18 |
| Blackburn | 20 |

*At the time of writing, sadly, Power BI Desktop doesn't have a Query Builder tool to help you construct an SQL query without needing to write any code. More bad news: there is a way to pass parameters to stored procedures, but it's complicated and doesn't work particularly well.*

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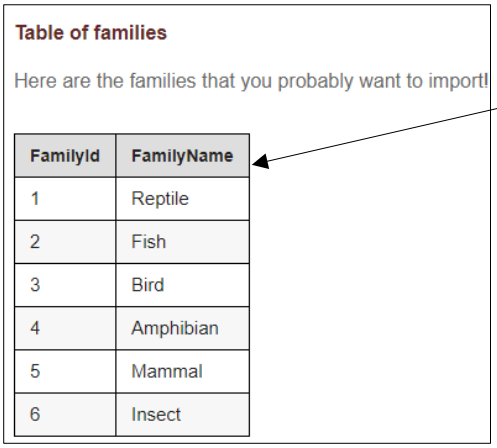
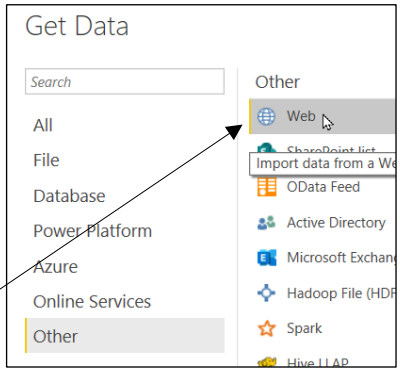
## 2.6 Importing from a Website

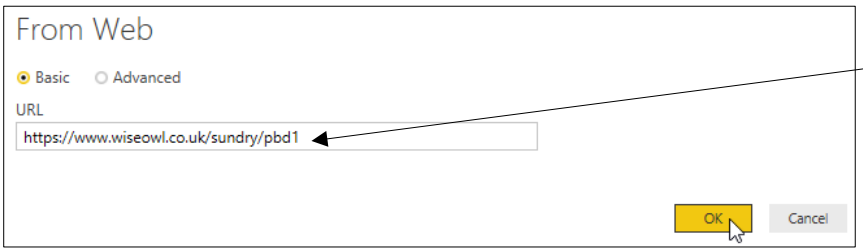
Power BI Desktop makes it easy to grab data from a website, as shown below:




a) Find a website which contains a table of data that you want to import (this one is at wiseowl.co.uk/sundry/pbd1/ ).

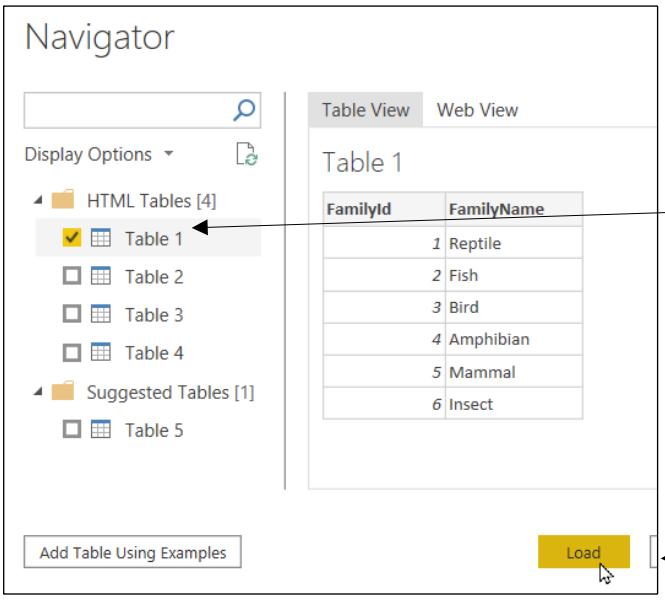
b) Choose to get data from a **Web** source in the **Other** category.



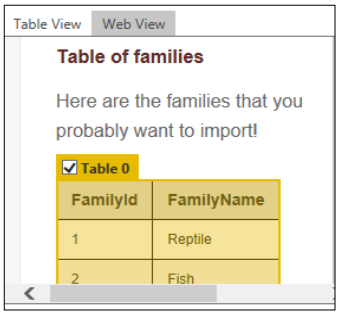




c) Enter the URL of the page containing the table you want to import and click **OK**.

d) If this is the first time you've connected to this page you'll be asked if you want to use any credentials. Here we're opting to connect to the site anonymously.



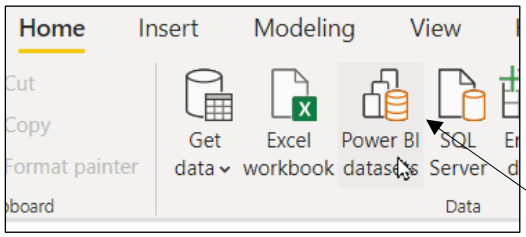

e) Tick the box next to any table you want to import. You may find this easier to do by switching to **Web View**:



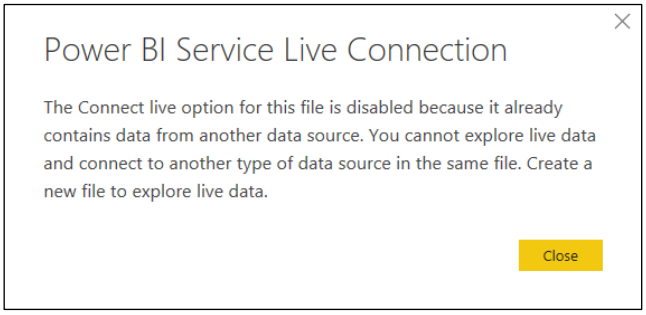

f) Click **Load** to import the tables you've selected.

## 2.7 Importing a Power BI Dataset

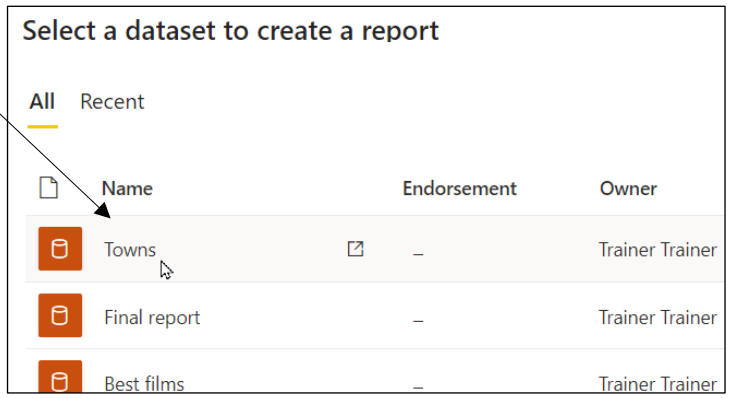
If someone has published a Power BI dataset on Power BI Service, here's how to load it:



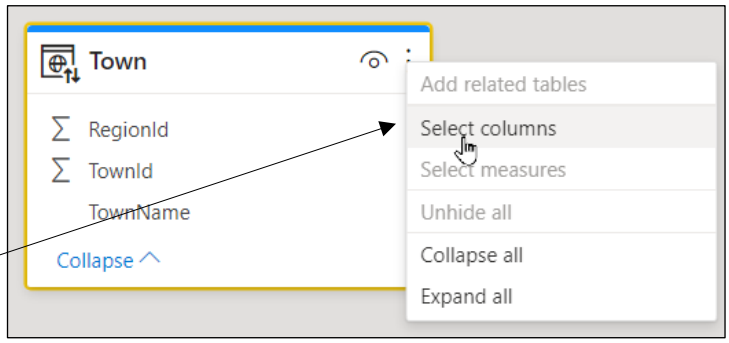

a) Click on this dedicated icon. If you get the following self-explanatory message, you won't be able to proceed:




b) Choose the published dataset that you want to load (note that if you're not currently signed in to Power BI Service, you'll need to do this first).




c) Power BI bypasses Query Editor and loads your data. There aren't as many things that you can do with this as with a normal query.

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## 2.8 Entering Data Manually

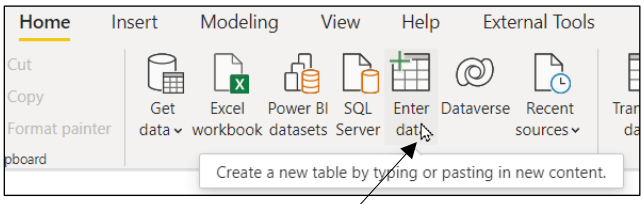
As well as importing existing data, Power BI Desktop allows you to enter data into a model manually.

### Pasting Data

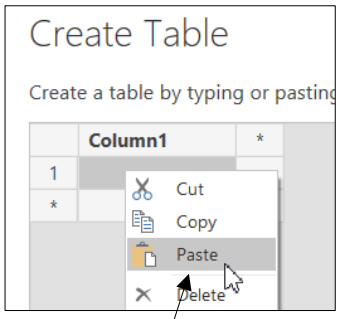
Although you can't import directly from Word, you can copy and paste:

| HabitatId | HabitatName | EnvironmentId | BackColour | ForeColour |
|---|---|---|---|---|
| 1 | Grasslands | 1 | Light green | Black |
| 2 | Forest | 1 | Dark green | White |
| 3 | Fresh water | 3 | LightBlue | Dark blue |
| 4 | Salt water | 3 | #78aaf5 | White |
| 5 | Desert | 1 | #d6a740 | Black |

a) In Word, select the table you want to import and copy it.



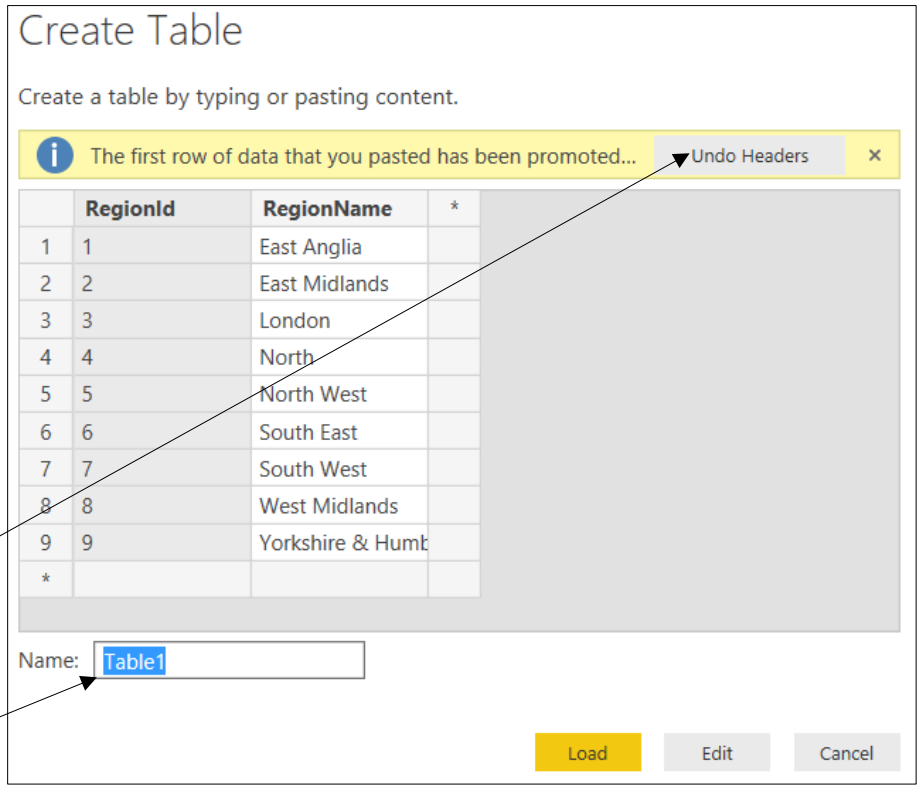

b) Click on this button to enter data into a new table.




c) Right-click on the empty grid and choose to paste in your data.

d) *Power BI Desktop* will decide whether the first row of your table should become the header columns.

e) Give your table a better name, then click **Load**.




**Wise Owl's Hint**

*If you copy and paste data, you obviously won't be able to refresh the resulting table to bring in updates.*

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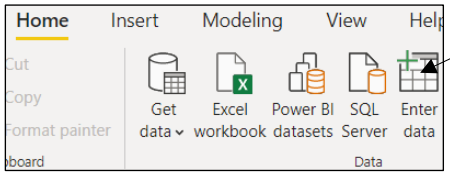
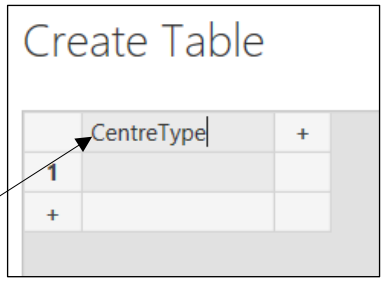
## Typing in Data

The final option for loading data into a model in *Power BI Desktop* is to type it in!

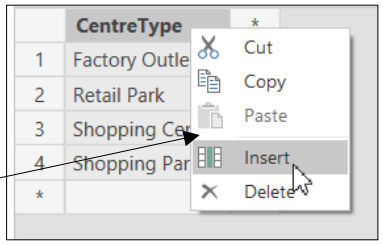



a) From the ribbon select this icon to enter data.

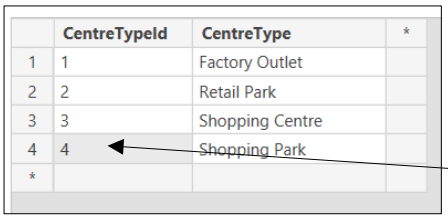



b) You can overtype any column name to rename it.

c) Type in the data that you want to store in the table.

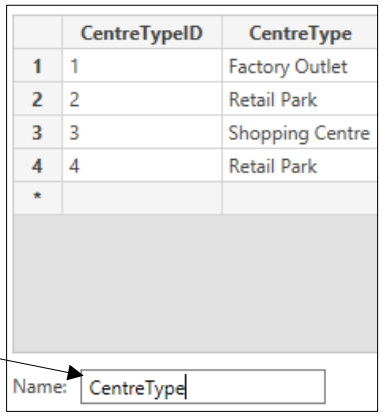



d) Right-click to insert any additional columns that you need.



| | CentreTypeId | CentreType | * |
|---|---|---|---|
| 1 | 1 | Factory Outlet | |
| 2 | 2 | Retail Park | |
| 3 | 3 | Shopping Centre | |
| 4 | 4 | Shopping Park | |
| * | | | |

e) Type in any data for new columns that you've added.



| | CentreTypeID | CentreType |
|---|---|---|
| 1 | 1 | Factory Outlet |
| 2 | 2 | Retail Park |
| 3 | 3 | Shopping Centre |
| 4 | 4 | Retail Park |
| * | | |

Name: CentreType

f) Give the table a name and click **Load** to add it to the report.

# 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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