VIRTAVIS LEARNING

FREE CHEAT SHEET

Power BI for Data Analytics

Power Query, DAX, modelling and sharing: what analysts use most.

THE WORKFLOW

Get data › Transform › Model › Visualise › Share

GOLDEN RULE

Use **measures**, not calculated columns, for anything you add up. A measure recalculates for every filter.

FIND YOUR WAY AROUND

Power BI Desktop at a glance.

VIEWS icons down the left edge

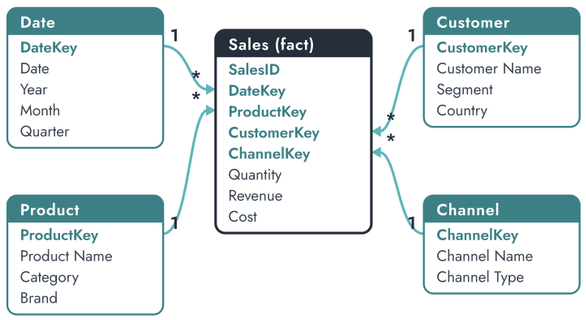
Report	Build visuals and pages
Table	Check the loaded data (was Data view)
Model	Relationships, keys and properties
DAX query	Write and test DAX queries
TMDL	Edit the model as code

RIBBON BUTTONS YOU'LL USE MOST

Get data	Home
Transform data	Home: opens Power Query
Refresh	Home
New measure	Home or Modeling
Manage roles	Modeling: row-level security
Performance analyzer	Optimize
Publish	Home: sends to the Service

MODEL A STAR SCHEMA

One fact table, linked to dimension tables.



- **Dimensions describe** who, what, when and where. **The fact table records** each sale.
- **One-to-many (1 to *).** Filters flow from the dimension to the fact table, as the arrows show.
- **Keys link tables.** Every key in Sales should exist in its dimension.
- **Hide the key columns** so report builders pick names, not ID numbers.

POWER QUERY (M)

Clean data before it reaches the model.

Filter out nulls
```
Table.SelectRows(Source, each [Revenue] <> null)
```
Keeps rows where Revenue has a value

Set data types
```
Table.TransformColumnTypes(Source, {{"Revenue", type number}, {"Date", type date}})
```
Do this early: wrong types break sums and dates

Rename columns
```
Table.RenameColumns(Source, {{"Old Name", "New Name"}})
```

Trim spaces
```
Table.TransformColumns(Source, {{"Name", Text.Trim, type text}})
```

Remove duplicates
```
Table.Distinct(Source, {"SalesID"})
```
No column list = compare whole rows

Add a column
```
Table.AddColumn(Source, "Profit", each [Revenue] - [Cost], type number)
```

Merge (join)
```
Table.NestedJoin(Sales, {"CustomerKey"}, Customer, {"CustomerKey"}, "Customer", JoinKind.LeftOuter)
```
Then expand the new column to pick fields

Append (stack)
```
Table.Combine({Jan, Feb, Mar})
```
Same column names in every table

Unpivot
```
Table.UnpivotOtherColumns(Source, {"Product"}, "Month", "Sales")
```
Turns month columns into rows

CORE DAX MEASURES

Write once, reuse in every visual.

Totals
```
Total Sales = SUM(Sales[Revenue])
Total Cost = SUM(Sales[Cost])
```
A measure is a calculation, not stored data

Profit
```
Profit = [Total Sales] - [Total Cost]
```
Build measures from measures

Margin %
```
Margin % = DIVIDE([Profit], [Total Sales])
```
DIVIDE gives blank, not an error, for ÷ 0

Count rows
```
Sales Count = COUNTROWS(Sales)
```
One row per sale

Count unique
```
Customers = DISTINCTCOUNT(Sales[CustomerKey])
```

Row by row
```
Profit X = SUMX(Sales, Sales[Revenue] - Sales[Cost])
```
X functions calculate each row, then add up

If / else
```
Band = SWITCH(TRUE(), [Total Sales] >= 1000000, "High", [Total Sales] >= 500000, "Medium", "Low")
```
First true test wins: biggest first

TIME INTELLIGENCE

Needs a marked date table.

Date table
```
Date = CALENDAR(DATE(2024, 1, 1), DATE(2026, 12, 31))
```
Cover every year in the data, then Mark as date table

Year to date
```
Sales YTD = TOTALYTD([Total Sales], 'Date'[Date])
```

Same period last year
```
Sales LY = CALCULATE([Total Sales], SAMEPERIODLASTYEAR('Date'[Date]))
```

Growth %
```
YoY % = DIVIDE([Total Sales] - [Sales LY], [Sales LY])
```

Last 12 months
```
Sales 12M = CALCULATE([Total Sales], DATESINPERIOD('Date'[Date], MAX('Date'[Date]), -12, MONTH))
```

Running total
```
Running = CALCULATE([Total Sales], FILTER(ALL('Date'[Date]), 'Date'[Date] <= MAX('Date'[Date])))
```

CALCULATE AND FILTERS

Change what a measure can see.

Fixed filter
```
UK Sales = CALCULATE([Total Sales], Customer[Country] = "UK")
```
Overrides any Country filter on the page

% of grand total
```
% Total = DIVIDE([Total Sales], CALCULATE([Total Sales], ALL(Sales)))
```
ALL ignores every filter, slicers too

% of what's shown
```
% Shown = DIVIDE([Total Sales], CALCULATE([Total Sales], ALLSELECTED()))
```
Respects slicers, ignores the visual's rows

PICK THE RIGHT VISUAL

Start from what you want to show.

Card One key number	**Line** Trend over time	**Bar / column** Compare categories
Stacked column Parts of a total	**Matrix** Detail with subtotals	**Scatter** Two measures together
KPI Actual vs target	**Pie / donut** Share of a whole, up to 5 slices	**Slicer** Let users filter

REPORT DESIGN

Clear pages people trust.

- **Start from a question.** One page answers one business question.
- **Top left matters most.** Put the headline number there.
- **One colour, one meaning.** Highlight what matters, grey the rest.
- **Label units.** £k or £m, % and the time period.
- **Sort bars by value,** not A to Z.
- **Hide detail, don't cram it.** Use tooltips and drill-through.
- **Test with a real user.** Can they answer the question in 5 seconds?

KEEP IT FAST

Smaller models, quicker reports.

- **Remove unused columns.** The biggest win, done in Power Query.
- **Right data types.** Numbers as numbers, dates as dates.
- **Split date and time.** Fewer unique values compress better.
- **Prefer Import mode.** DirectQuery only for live or very big data.
- **Single-direction relationships.** Use both directions only when needed.
- **Run Performance analyzer.** Find the slow visual or measure.
- **Incremental refresh** for large tables that grow by date.

SHARE IN THE SERVICE

Publish, refresh, control access.

- **Publish to a workspace.** Datasets are now called semantic models.
- **Schedule refresh.** Up to 8 a day on Pro. On-premises data needs a gateway.
- **Workspace roles:** Admin, Member, Contributor, Viewer.
- **Row-level security** shows each person only their rows.
- **Publish an app** to share a set of reports with readers.
- **Data alerts** on dashboard card, KPI and gauge tiles.
- **Sensitivity labels** mark confidential data.

CHECK BEFORE YOU TRUST IT

Five checks before you publish.

1. **Totals match the source?** Compare one month's total with the finance system or file.
2. **All rows loaded?** COUNTROWS(Sales) against the source row count.
3. **A (Blank) row in a visual?** Sales rows whose key isn't in the dimension. Fix the keys.
4. **Relationships look right?** One-to-many, single direction. Question any many-to-many.
5. **Measures tested by hand?** Put them in a table by month and check two values.

Check the numbers. Then say what they mean.

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Power BI for Data Analytics

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