

2.3 LESSON NOTES

METRICS & DIMENSIONS

Data made up of data points called metrics & dimensions

Below is the slide presented in the lesson:

METRICS

QUANTITATIVE

‘NUMBERS’*

ESSENTIAL IN ALL ‘QUERIES’

ALWAYS HAVE **AGGREGATOR**
ATTACHED
(SUM,AVG,MIN,MAX ETC)

DIMENSIONS

QUALITATIVE

‘TEXT’ (NORMALLY)

ESSENTIAL TO VISUALISE DATA

USED TO BREAK DOWN METRICS

Some dimensions, e.g. Postcode can be numbers but are qualitative so are dimensions, not metrics.

2.4 LESSON NOTES

FORMATTING YOUR SPREADSHEET DATA

- No blank rows
- No merged cells
- No totals or subtotal
- Cells should only contain data - no notes, charts etc
- Date fields
 - Should contain at least Year, Month & Day
 - Should all have the same format (e.g. YYYY-MM-DD)
- Check all data is correctly formatted - check alignment
 - **Text** dimensions should be aligned to the **left**
 - **Metrics and Dates** should be aligned to the **right**

2.5 LESSON NOTES

CREATING A DATA SOURCE

Connecting to Google Sheets Data

STEP 1 - Choose data connector

- Select Google Sheets data connector
- The 1st time you use connector you will be asked to authorise Data Studio to connect to your Google Drive

STEP 2 - Choose data source

- Select Google Sheets file then the sheet within the file that you want to connect to
- You can only connect to one sheet at a time
- If you have no header row then uncheck “Use first row as header”
- It’s up to you whether you choose to include hidden and filtered cells

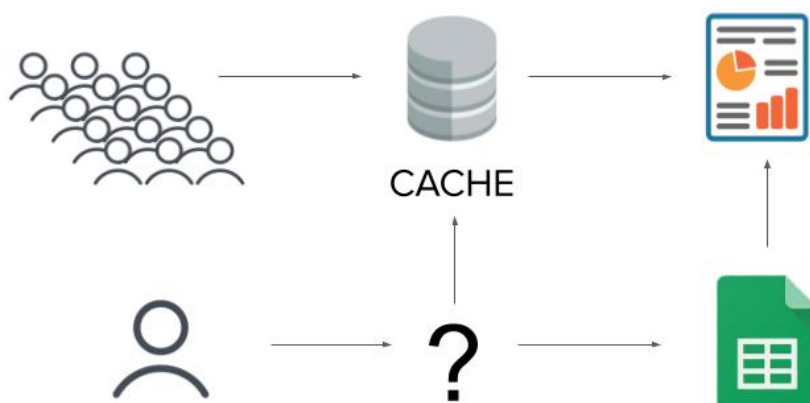
STEP 3 - Check the schema

- You can rename any fields by just clicking on them
- Make sure that Data Studio has assigned the correct data type to your fields and modify where necessary
- For metrics, change the default aggregator where you will want to be using one other than SUM, e.g. AVG
- **Record count** metric added to every Google Sheets data source in case the data does not contain any metrics

2.6 LESSON NOTES

DATA FRESHNESS

- Results of queries are stored in a cache
- Data Freshness is how long the results are stored before cache is emptied
- Data Studio will always check the cache first to see if the results of a query are already in there



Data refresh rates by connector

Different connectors support different data refresh rates, as follows. Note that Google marketing and measurement products, such as Google Ads, Google Analytics, Campaign Manager, Search Console, YouTube Analytics, and others, refresh every 12 hours. That rate can't be changed.

Connector	Freshness options
Google measurement products	Every 12 hours
Google Sheets	Every 15 minutes* Every 4 hours Every 12 hours
BigQuery	Every 1 hour Every 4 hours Every 12 hours*
Cloud and SQL connectors	Every 1 hour* Every 4 hours Every 12 hours
Community connectors	Varies
Other connectors	Varies

* Default refresh rate

3.2 LESSON NOTES

REPORT BUILDER FIRST LOOK

- Build reports by adding different objects, called '**components**' to the page
- Grid helps align objects in **Edit mode** but disappears in **View mode**. Grid properties can be modified in View menu
- You will mostly be using **buttons in toolbar** above page to add components, pages & data sources. However, there are certain functionalities, e.g. duplicating a page, that can only be accessed via the **menus**
- The section to the right of the report is where you build and style queries as well as modifying the properties of report themes

Untitled Report

File Editing View Insert Page Arrange Resource Help

⊕ Add a page ↶ ↷ ⌨ Add data 📊 Add a chart ⚙ Add a control < > 🖨 Print 🗑 Delete

Theme and layout

You will mainly use these buttons to add components to report

	FY	Record Count
1.	FY20	1,260
2.	FY18	900
3.	FY19	900
4.	FY17	864
5.	FY21	216

1 - 5 / 5 < >

Here you will build and style queries

Chart > Table

DATA STYLE

Data source

Project Specificati...

BLEND DATA

Date Range Dimension

Date

Dimension

FY

Add dimension

Drill down

Metric

Record Count

Add metric

Optional metrics

Metric sliders

Rows per Page

100

Summary row

Show summary row

Sort

Record Count

Descending

Available Fields

Type to search

Date

Detail

FY

Sub-type

Type

COS - Mktg

COS - Website

FY Number

Income - Branding

Income - Mktg

Income - Web

Previous FY

Previous year

Value

Year Diff

Externals

Growth/Month

Record Count

Total Income

ADD A FIELD

ADD A PARAMETER

Show all

3.14 LESSON NOTES

COMMUNITY VISUALISATIONS



- Google has opened up the Data Studio platform to 3rd party developers for them to create their own visualisations
- Access to these additional visualisation types is activated at a data source level in the schema
- Recommended chart types are Sunburst, Waterfall, Candlestick, Radar and Gauges
- In some cases, the way these visualisations have been created limits them in terms of functionality. Your data may not be structured in a way that makes them usable for you

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LIMITS OF PIVOT TABLES

- Pivot tables can process up to 50,000 rows of data, however, depending on the data set and dimensions and metrics involved in the table, performance may degrade. You can apply a filter to the pivot table to reduce the amount of data being processed.
- The number of row dimensions available depends on the type of data you're connecting to.
- You may have up to 3 pivot tables per page in a report.
- Pivot tables do not paginate, as do standard tables.
- You can't apply metric filters to pivot tables; doing so displays an error message.

3.13 LESSON NOTES

PIVOT TABLES



- Let's you break down dimensions with other dimensions, like cross tabulation
- As with tables you have 3 versions (numbers, bars, heatmaps)
- Limited in terms of amount of data that can be processed for query (50,000 rows). Depending on make up of query, you might get error when you first add one to report
- Row dimension values displayed on rows, column on columns.
- Can add both row and column totals
- With rows, the number of dimensions you can add depends on data source:
 - Mapped schema data - can have up to 5
 - Flexible schema data - can have up to 10
- Can only ever have a max of 2 dimensions in columns
- Adding more than 1 dimension to rows allowss you to use the “Expand-Collapse” functionality which is great for saving space on a report
- Have same style options as with regular tables with the addition of highlight colour

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3.12 LESSON NOTES

TABLES



- 3 types of table available: standard, with bars and with heatmap
- Can add up to 5 dimensions and 10 metrics to a table
- Can add summary row to a table that will be calculated on whole result, not just the rows displayed
- Be careful about sorting. Data Studio sometimes leaves the original metric used for the table as the primary sort even when it has been removed from the query
- Can set the number of rows contained per page in the data tab. Best to set number of rows to 10 or even 5 to a point where there's no scrolling in the published report. Scrolling is problematic when downloading
- Can optimise space in a table by:
 - Manually dragging the columns to resize
 - Wrapping headers and body text in style options
 - Removing row number in style options
- Lots of options in terms of modifying style of tables:
 - Change colours of headers, text, grid, footer etc
 - Change alignment of cells
 - Change numbers to display bars or heatmaps instead
 - Can revert to defaults at bottom of Style tab

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Conditional formatting

- Found at top of Style tab
- Applied by creating rules that contain:
 1. Colour type - single or colour scale
 2. Format rules - select fields and conditions
 3. Colour & Style - Applied to text, row or cell background
- Can add multiple rules to the same table
- Colour scale - can set 3 values and colours

3.11 LESSON NOTES

TREEMAPS



- Great for visualising hierarchies in data (e.g. category and subcategory)
- The size and colour of a block within the treemap represents its value in the total result
- Can have up to 5 levels (dimensions) in the hierarchy. Default set to 2
- Can have up to 5000 values in a treemap but not recommended to have so many. Number would depend on size of treemap in report and whether the data is easily readable
- Style options limited. Can change min, mid and max colours and show or hide branch headers and scale

3.10 LESSON NOTES

BULLET CHARTS



- Fairly simplistic and unintuitive in Data Studio but used to show how a particular metric is performing in relation to a target
- Can set 3 range limit values and a target. Set to 1,2,3 and 1.5 respectively by default
- Because the values are set and do not change, they're not very useful when you're filtering data as that will reduce the amount of data and make the target and range limits redundant
- Can add a comparison date period and change the colour of the bar. However, the colour applied to the comparison period cannot be changed. It will be set as a lighter version of the main colour you set
- A good alternative to bullets is gauge charts that are not available in the list of standard chart types but are available via the community visualisations

3.9 LESSON NOTES

SCATTERPLOT & BUBBLE CHARTS



- Good for seeing distribution of values by comparing 1 metric against another
- Scatter and Bubble are essentially built in the same way with only one main difference
- You add 2 metrics to Metric X and Metric Y areas of query
- Recommendation is to use 'Auto' in the x and y axes minimum and maximum values to spread data out
- By adding metric (a third one or an existing one) to 'Bubble Size', you can see potentially 3 metrics correlated. This is also what turns a Scatter into a Bubble
- Adding size metric allows you to identify outliers in the data
- You can add 2nd dimension to the chart and use Colour encoding. You can choose the dimension to use for the colours in the style options. Really helps to make reading data easier

3.8 LESSON NOTES

LINE & COMBO CHARTS



- Line charts **not to be used** unless you have data that follows some kind of progression or evolution in time. Otherwise use a Time Series chart
- Also, with Time Series charts you can create a combo chart by turning series into bars
- That is all.

3.7 LESSON NOTES

GEOGRAPHIC/MAPS



- 2 types of Geo visualisation: Geo Map & Google Maps (2 versions)
- Need to make sure that your geographical dimensions are correctly specified as a geo type in the schema of your data source

Geo Maps

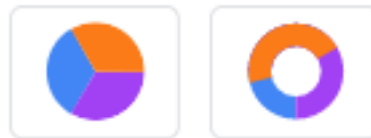
- The highest level geographical dimensions (country, state, region etc) will be displayed as filled in areas. Lower-level dimensions (city, postcode etc) will display as points/bubbles
- When displayed as filled in areas, the colour of the area is based on its metric value. The colour scale can be set in the style options.
- When displayed as points/bubbles, both the colour and the size indicate the metric value
- Can set a Zoom area when data includes different countries and continents. The area applied is not a data filter, just a visual one

Google Maps

- More elements available compared to standard Geo Map
 - Can be colour AND size encoded
 - Can add tooltips to help display a value that makes more sense to the geo points. Dimension used must only contain 1 value for each corresponding geo point
 - Can add dimension to colour encoding to colour code things like regions (but only when there's no dimension in tooltips)
- Can show map as standard map or satellite view
- Can edit JSON to modify map's appearance
- Can choose amount of detail relating to roads, landmarks and labels
- Can activate/deactivate Map Controls, including Street View

3.6 LESSON NOTES

PIE CHARTS



- **Should only be used when you have no more than 5 (my personal recommendation) values to display**
- Very simple to build. Only 1 metric and 1 dimension allowed
- Set to only show 10 values/slices but this can be changed in Style tab. When more values in result than number of slices set, the remaining values will be added to a value called “other”
- Can introduce a hole into the middle of a pie chart using the style options. This turns it into a donut
- Can display either percentage, label or value in the chart

3.5 LESSON NOTES

TIME SERIES & AREA CHARTS



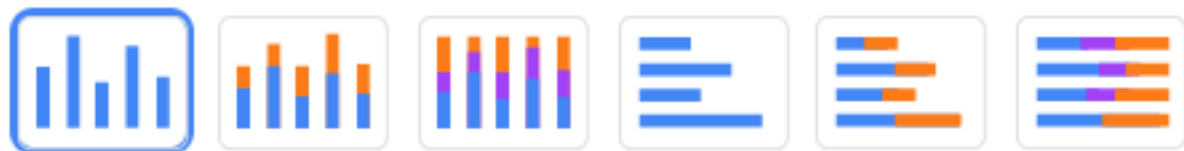
- **6 different types to choose from:**
 - The 3 Time Series versions are all built in the same way. The **differences are only stylistic**.
 - The 3 Area Charts are regular, stacked and stacked 100%
- **Can only add date** as the primary dimensions of the query but breakdown dimension can be anything
- To modify the date **granularity**, you can click on the edit pencil next to the date dimension
- Like column and bar charts, you can add **up to 5 metrics** side by side unless breakdown dimension present. **Double Y-axis** also available
- Can add **date range** filter AND **comparison period** that will show 2 periods in 2 lines/series
- More Style options:
 - Can turn lines into bars
 - Cumulative values, e.g. running total
 - Add points
 - **Trend lines** (linear, exponential, polynomial)
 - Reference lines (constant, calculated)
 - Missing values (recommend to leave on “Line to zero”)
- **Smoothed time series** chart is just a regular time series but with “smoothing” option activated in Style tab

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- **Sparkline** is just a time series without axes, grid, labels etc. Often small in size and allows an at-a-glance view of a metric's evolution
- **Area charts need a breakdown dimensions to work**
- Area chart is just time series with area underneath line filled in. Idea being to display volume

3.4 LESSON NOTES

COLUMN & BAR CHARTS

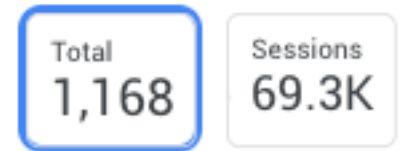


- **6 different types to choose from** but there are only really stacked and non-stacked versions of column and bar charts. The 100% stacked can be activated in the style options
- Needs **metric AND dimension**
- By default, **only up to 10 columns/bars displayed** when adding chart but this can be changed in the style options. Results displayed will be based on the sort applied to the query
- **BE VERY CAREFUL** when changing the sort method on the query as this could potentially change the result, i.e. the dimensions values displayed in the chart
- Breakdown dimension can be added to break down the primary dimension
- Drill Down can be added (see Lesson 8.4)
- Can add up to 5 metrics to query except when breakdown dimension present then you can only add 1
- Can add a 2nd Y-axis to the chart in the style options when you have 2 metrics (no more than that) that need different scales to be displayed properly
- Stacked and Stacked 100% options can be activated in Style tab
- Can add constant or calculated Reference lines to charts

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3.3 LESSON NOTES

SCORECARDS



- Only display single figure so **no dimensions involved**
- 2 different scorecard options, **with and without compact numbers**. Compact numbers can be activated in the style options
- Style options also allow you to **set the numbers of decimals** displayed
- As with all queries make sure to first check:
 - Data Source
 - Date Range Dimensions (used for when filtering by date)
- Can **rename** the field for the scorecard and **set its aggregator** (where available) by clicking on the edit pencil next to the metric
- Optional metrics can be activated (see lesson 8.4 for more details)
- Can apply a **date range filter** and also a **comparison period** to the query in order to display difference between the 2 periods. Displayed as percentage by default but can be changed to absolute value
- Can apply data filters (see lesson 4.3)