

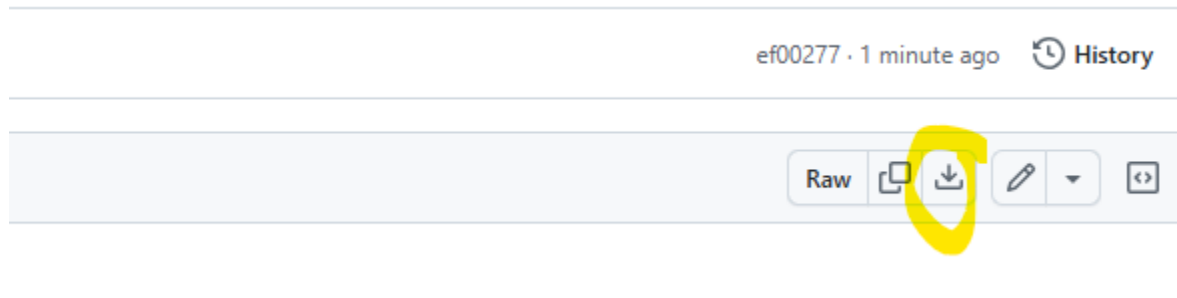
Introduction to Power BI

[Workshop Activities](#) / 1 Power Query

Part 1 Power Query

Step 0: **DOWNLOAD** by [going to vgsales.csv on GitHub](#) click the download button in the top right-hand corner !

Find all Links and videos at uviclibraries.github.io/PowerBI/all-links.html



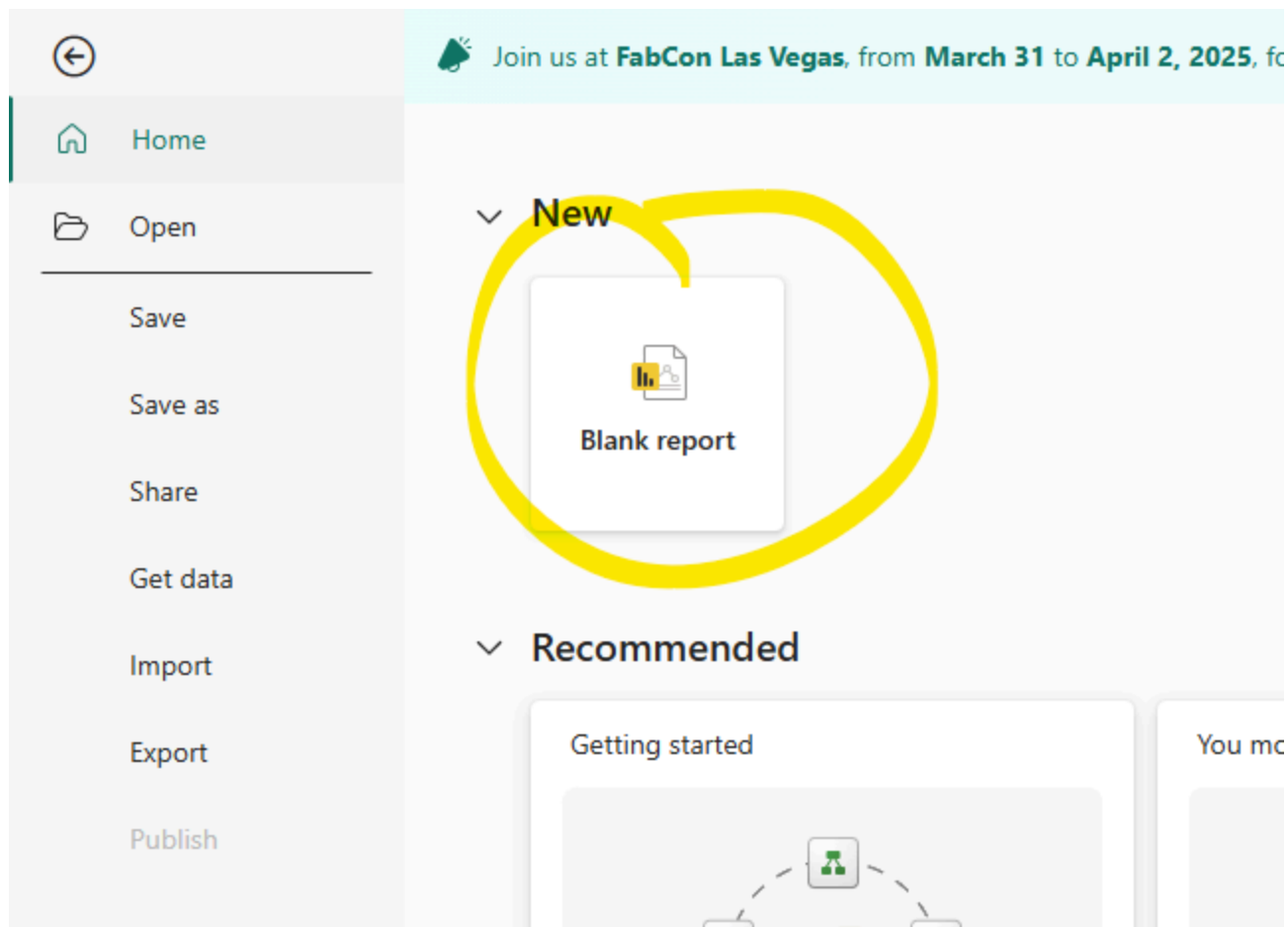
Reminder

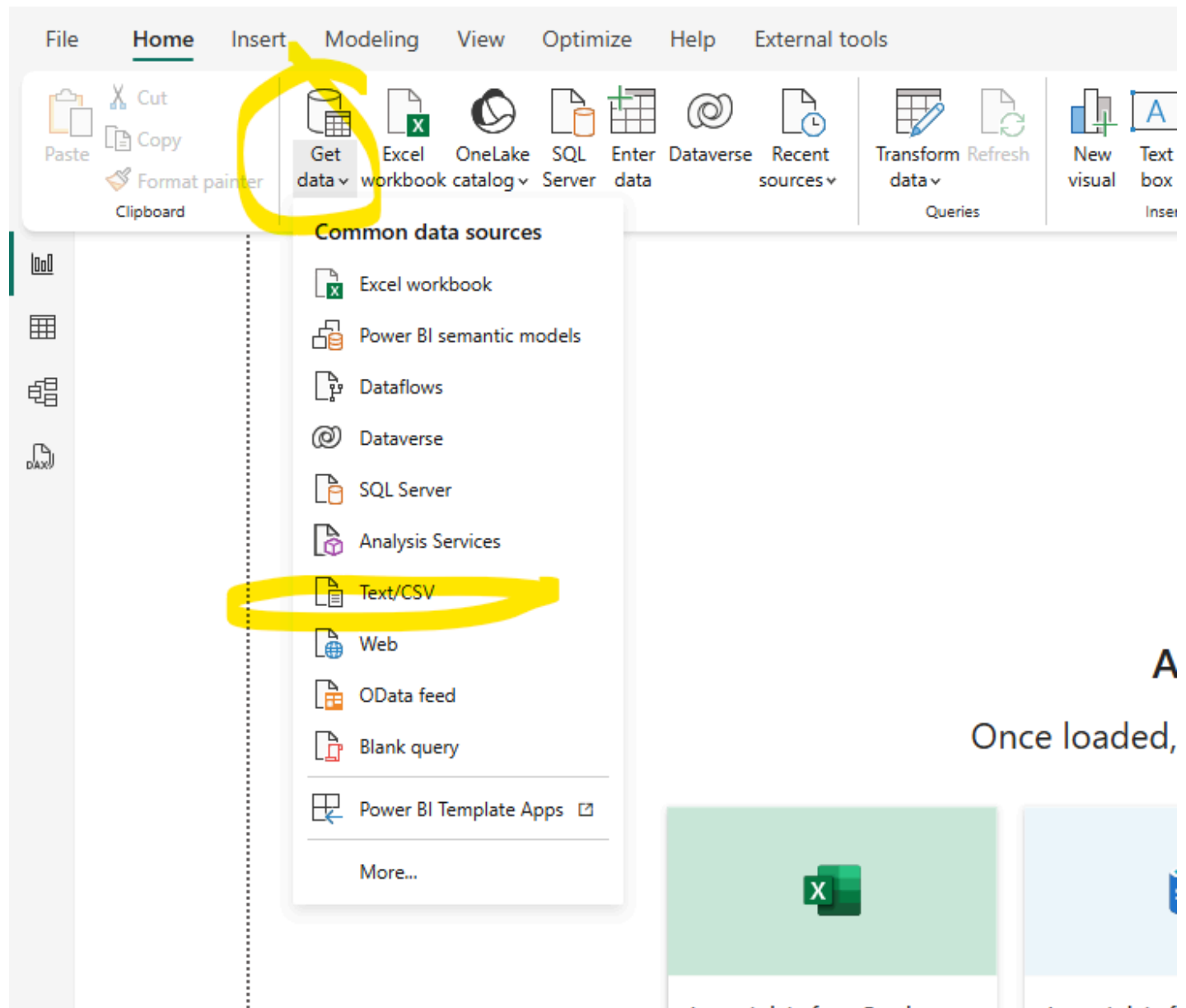
In Power Query we want to transform the data to make it compatible with Power BI, so it's closely related to the relationship and model building part of Power BI. We can also do some data cleaning in Power Query, although it is not its main function.

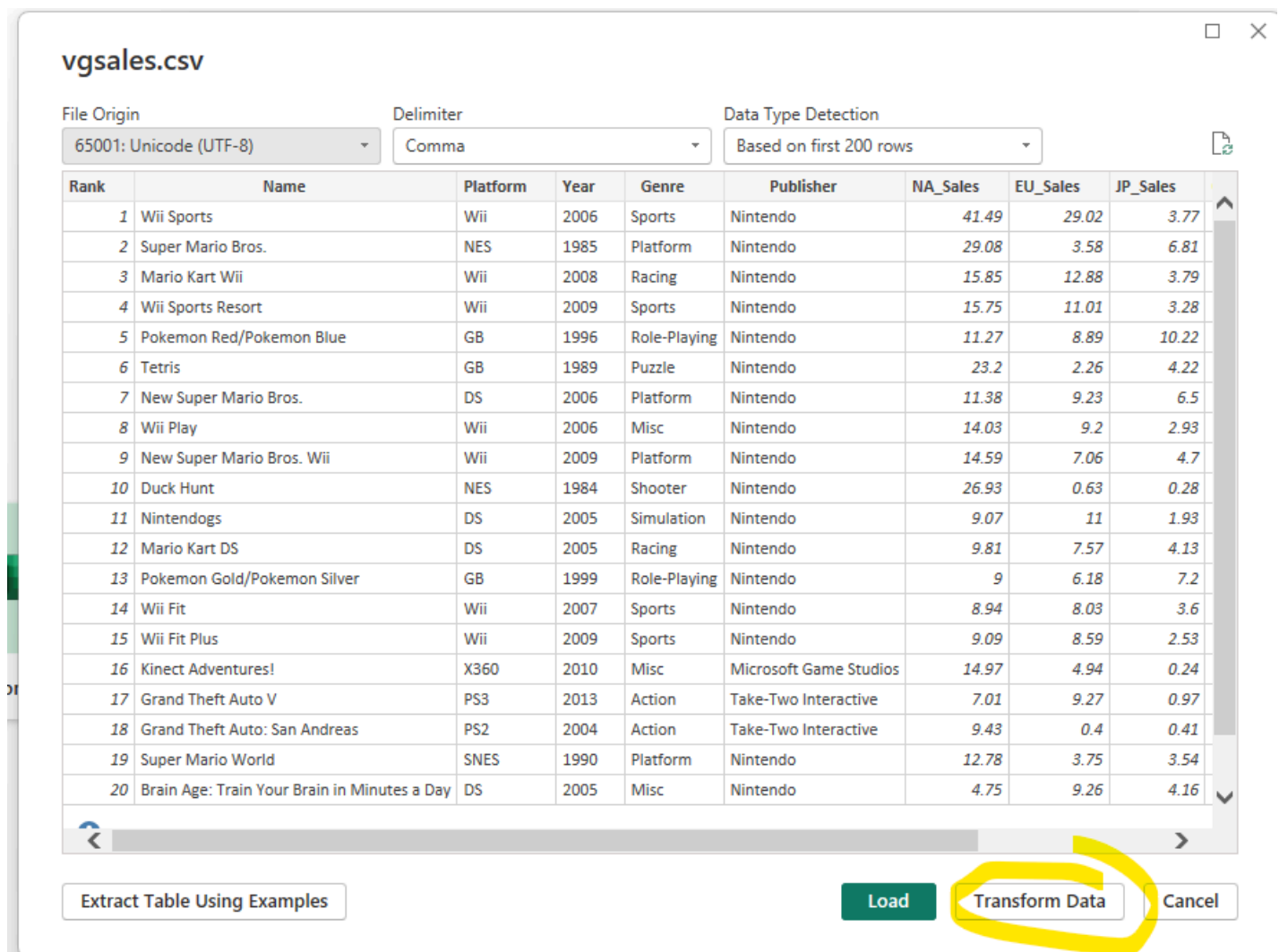
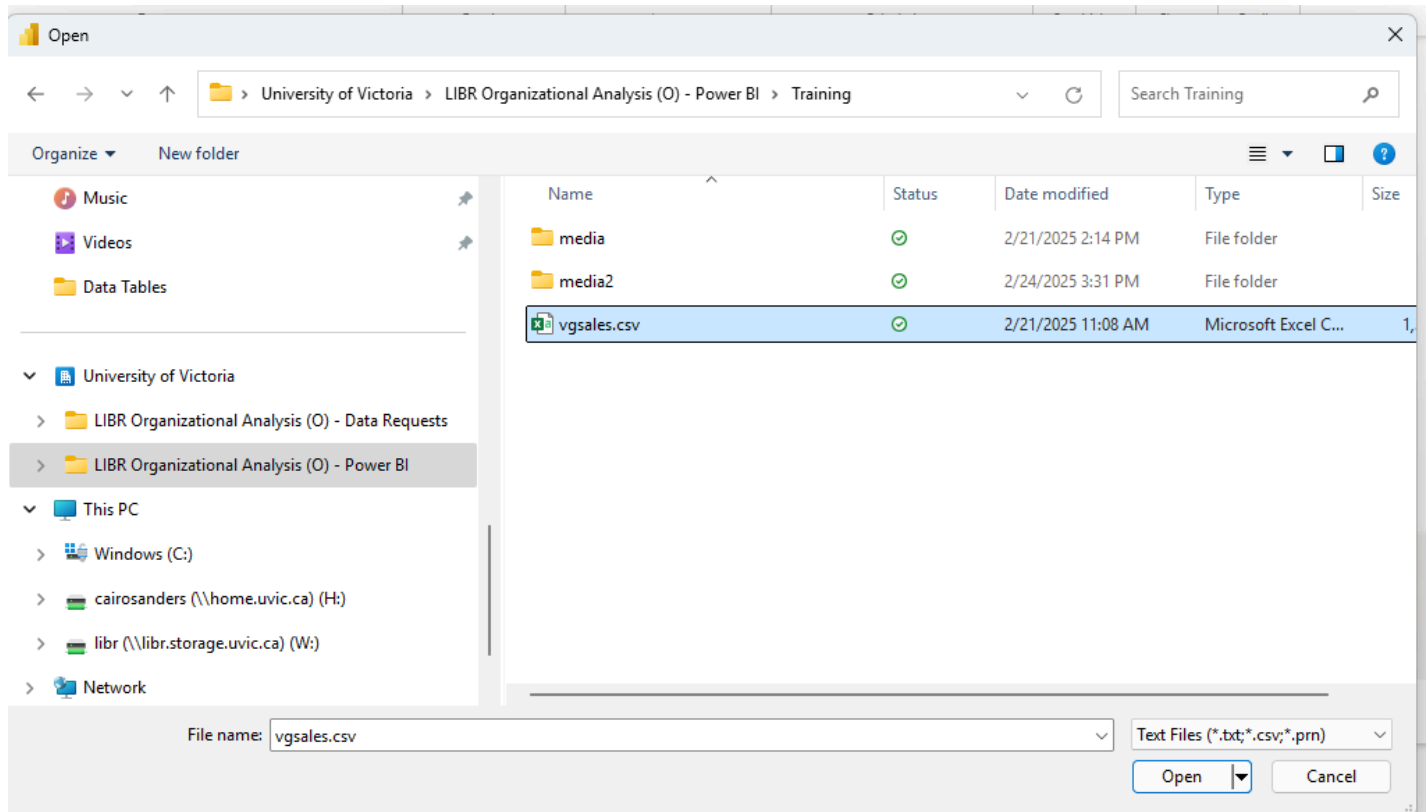
Step 1: loading in the data

- in Power BI select New "blank report"
- under the home Tab select "get data" and choose "Text/CSV"
- find the where you saved "vgsales.csv" and open it
- choose "Transform Data"

▼ **Click here for pictures to help you through step 1**







Step 2: transforming the data

We want to transform the data to work in a star schema. I often think of the "points" of the star as being the categories (qualitative) that will filter the data and the core of the star being where the data measures (quantitative) will be, along with connections to the points. Looking at the columns in your dataset, which do you think would be filter categories?

Here are descriptions for the columns:

Rank - Ranking of overall sales for a game

Name - The game name

Platform - Platform of the game's release

Year - Year of the game's release

Genre - Genre of the game

Publisher - Publisher of the game

NA_Sales - Sales in North America (in millions)

EU_Sales - Sales in Europe (in millions)

JP_Sales - Sales in Japan (in millions)

Other_Sales - Sales in the rest of the world (in millions)

Global_Sales - Total worldwide sales

To make your dimension tables (the points of your star)

- 1 right click on the **vgsales** query in the Queries pane
- 2 choose reference, this creates a duplicate table that is still connected to the first table
- 3 choose one of the categories that will be a dimension
- 4 right click on the column header and choose "remove other columns". ***NOTE that dimension tables often have multiple columns but in this example each dimension table only has one column**
- 5 right click on the column header again and select "remove duplicates"
- 6 now rename the table under the "Query Settings" pane to something reflective of your selected column
- 7 repeat steps 1-6 for all the dimension tables. Eventually you should have the following tables
 - vgsales
 - Platforms
 - Years

- Genres
- Publishers

Make your years column a number type. This will help with sorting and filtering

- 1 in the *vgsales* table, change the data type of **Year** to whole number by clicking on the symbol on the left-hand side of the column header
- 2 replace the errors with nulls by right clicking on the Year header and selecting "replace errors" replace them with "null"
- 3 in the *Year* table filter out the null by clicking on the arrow on the right-hand side of the column header and un-selecting (null)

Find all Links and videos at uviclibraries.github.io/PowerBI/all-links.html

▼ **Click here for pictures to help you through step 2**

Table.TransformColumnTypes(#"Promoted Headers",{{"Rank", Int64.Type}, {"Name", type text}, {"Platform", type text}, {"Year", type text}, {"Genre", type text},

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | AC | AD | AE | AF | AG | AH | AI | AJ | AK | AL | AM | AN | AO | AP | AQ | AR | AS | AT | AU | AV | AW | AX | AY | AZ | BA | BB | BC | BD | BE | BF | BG | BH | BI | BJ | BK | BL | BM | BN | BO | BP | BQ | BR | BS | BT | BU | BV | BW | BX | BY | BZ | CA | CB | CC | CD | CE | CF | CG | CH | CI | CJ | CK | CL | CM | CN | CO | CP | CQ | CR | CS | CT | CU | CV | CW | CX | CY | CZ | DA | DB | DC | DD | DE | DF | DG | DH | DI | DJ | DK | DL | DM | DN | DO | DP | DQ | DR | DS | DT | DU | DV | DW | DX | DY | DZ | EA | EB | EC | ED | EE | EF | EG | EH | EI | EJ | EK | EL | EM | EN | EO | EP | EQ | ER | ES | ET | EU | EV | EW | EX | EY | EZ | FA | FB | FC | FD | FE | FF | FG | FH | FI | FJ | FK | FL | FM | FN | FO | FP | FQ | FR | FS | FT | FU | FV | FW | FX | FY | FZ | GA | GB | GC | GD | GE | GF | GG | GH | GI | GJ | GK | GL | GM | GN | GO | GP | GQ | GR | GS | GT | GU | GV | GW | GX | GY | GZ | HA | HB | HC | HD | HE | HF | HG | HH | HI | HJ | HK | HL | HM | HN | HO | HP | HQ | HR | HS | HT | HU | HV | HW | HX | HY | HZ | IA | IB | IC | ID | IE | IF | IG | IH | II | IJ | IK | IL | IM | IN | IO | IP | IQ | IR | IS | IT | IU | IV | IW | IX | IY | IZ | JA | JB | JC | JD | JE | JF | JG | JH | JI | IJ | JK | KL | JM | JN | JO | JP | JQ | JR | JS | JT | JU | JV | JW | JX | JY | JZ | KA | KB | KC | KD | KE | KF | KG | KH | KI | KJ | KK | KL | KM | KN | KO | KP | KQ | KR | KS | KT | KU | KV | KW | KX | KY | KZ | LA | LB | LC | LD | LE | LF | LG | LH | LI | LJ | LK | LL | LM | LN | LO | LP | LQ | LR | LS | LT | LU | LV | LW | LX | LY | LZ | MA | MB | MC | MD | ME | MF | MG | MH | MI | MJ | MK | ML | MM | MN | MO | MP | MQ | MR | MS | MT | MU | MV | MW | MX | MY | MZ | NA | NB | NC | ND | NE | NF | NG | NH | NI | NJ | NK | NL | NM | NN | NO | NP | NQ | NR | NS | NT | NU | NV | NW | NX | NY | NZ | OA | OB | OC | OD | OE | OF | OG | OH | OI | OJ | OK | OL | OM | ON | OO | OP | OQ | OR | OS | OT | OU | OV | OW | OX | OY | OZ | PA | PB | PC | PD | PE | PF | PG | PH | PI | PJ | PK | PL | PM | PN | PO | PP | PQ | PR | PS | PT | PU | PV | PW | PX | PY | PZ | QA | QB | QC | QD | QE | QF | QG | QH | QI | QJ | QK | QL | QM | QN | QO | QP | QQ | QR | QS | QT | QU | QV | QW | QX | QY | QZ | RA | RB | RC | RD | RE | RF | RG | RH | RI | RJ | RK | RL | RM | RN | RO | RP | RQ | RR | RS | RT | RU | RV | RW | RX | RY | RZ | SA | SB | SC | SD | SE | SF | SG | SH | SI | SJ | SK | SL | SM | SN | SO | SP | SQ | SR | SS | ST | SU | SV | SW | SX | SY | SZ | TA | TB | TC | TD | TE | TF | TG | TH | TI | TJ | TK | TL | TM | TN | TO | TP | TQ | TR | TS | TT | TU | TV | TW | TX | TY | TZ | UA | UB | UC | UD | UE | UF | UG | UH | UI | UJ | UK | UL | UM | UN | UO | UP | UQ | UR | US | UT | UU | UV | UW | UX | UY | UZ | VA | VB | VC | VD | VE | VF | VG | VH | VI | VJ | VK | VL | VM | VN | VO | VP | VQ | VR | VS | VT | VU | VV | VW | VX | VY | VZ | WA | WB | WC | WD | WE | WF | WG | WH | WI | WJ | WK | WL | WM | WN | WO | WP | WQ | WR | WS | WT | WU | WV | WW | WX | WY | WZ | XA | XB | XC | XD | XE | XF | XG | XH | XI | XJ | XK | XL | XM | XN | XO | XP | XQ | XR | XS | XT | XU | XV | XW | XX | XY | XZ | YA | YB | YC | YD | YE | YF | YG | YH | YI | YJ | YK | YL | YM | YN | YO | YP | YQ | YR | YS | YT | YU | YV | YW | YX | YY | YZ | ZA | ZB | ZC | ZD | ZE | ZF | ZG | ZH | ZI | ZJ | ZK | ZL | ZM | ZN | ZO | ZP | ZQ | ZR | ZS | ZT | ZU | ZV | ZW | ZX | ZY | ZZ |
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Choose Columns

Choose the columns to keep

(Select All Columns)

- ☒ Rank
- ☒ Name
- ☒ Platform
- ☒ Year
- ☒ Genre
- ☒ Publisher
- ☒ NA_Sales
- ☒ EU_Sales
- ☒ JP_Sales
- ☒ Other_Sales
- ☒ Global_Sales

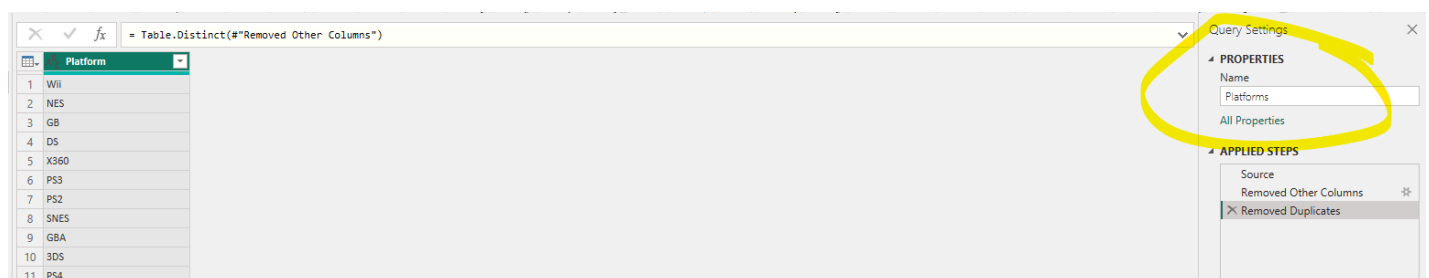
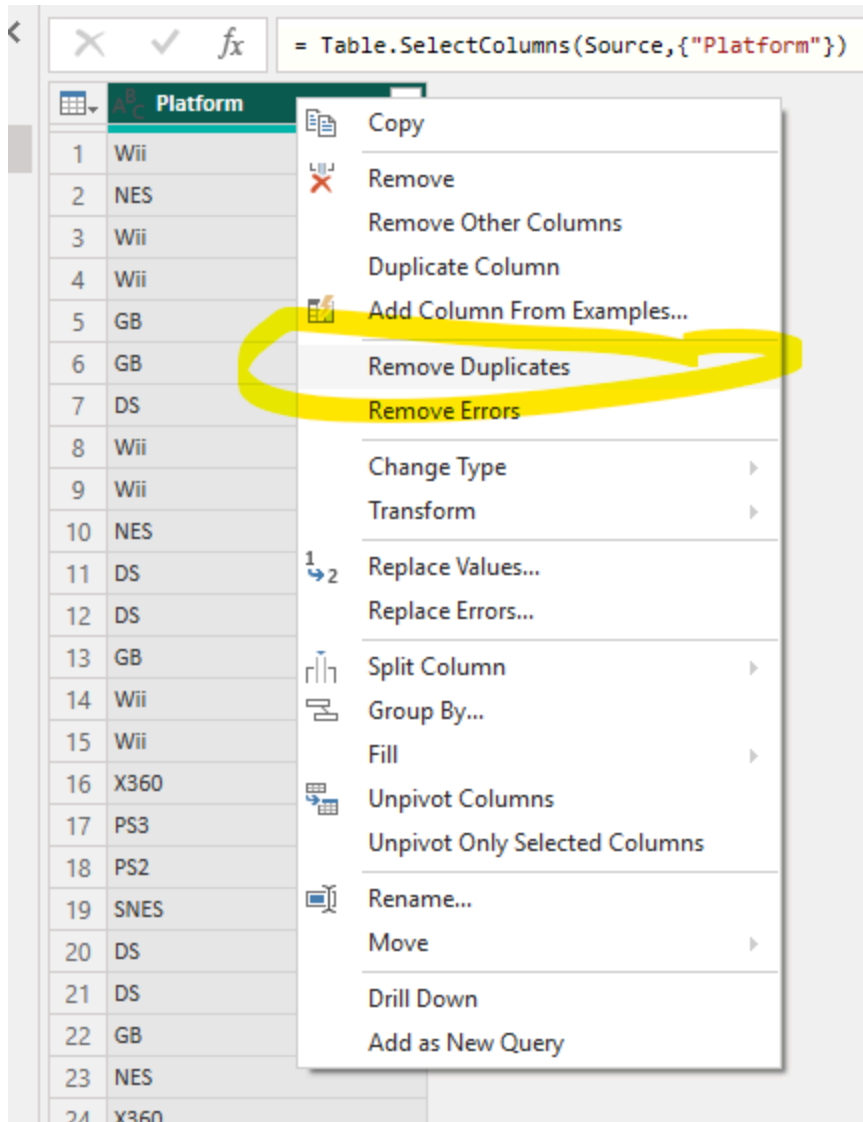
OK Cancel

vgsales

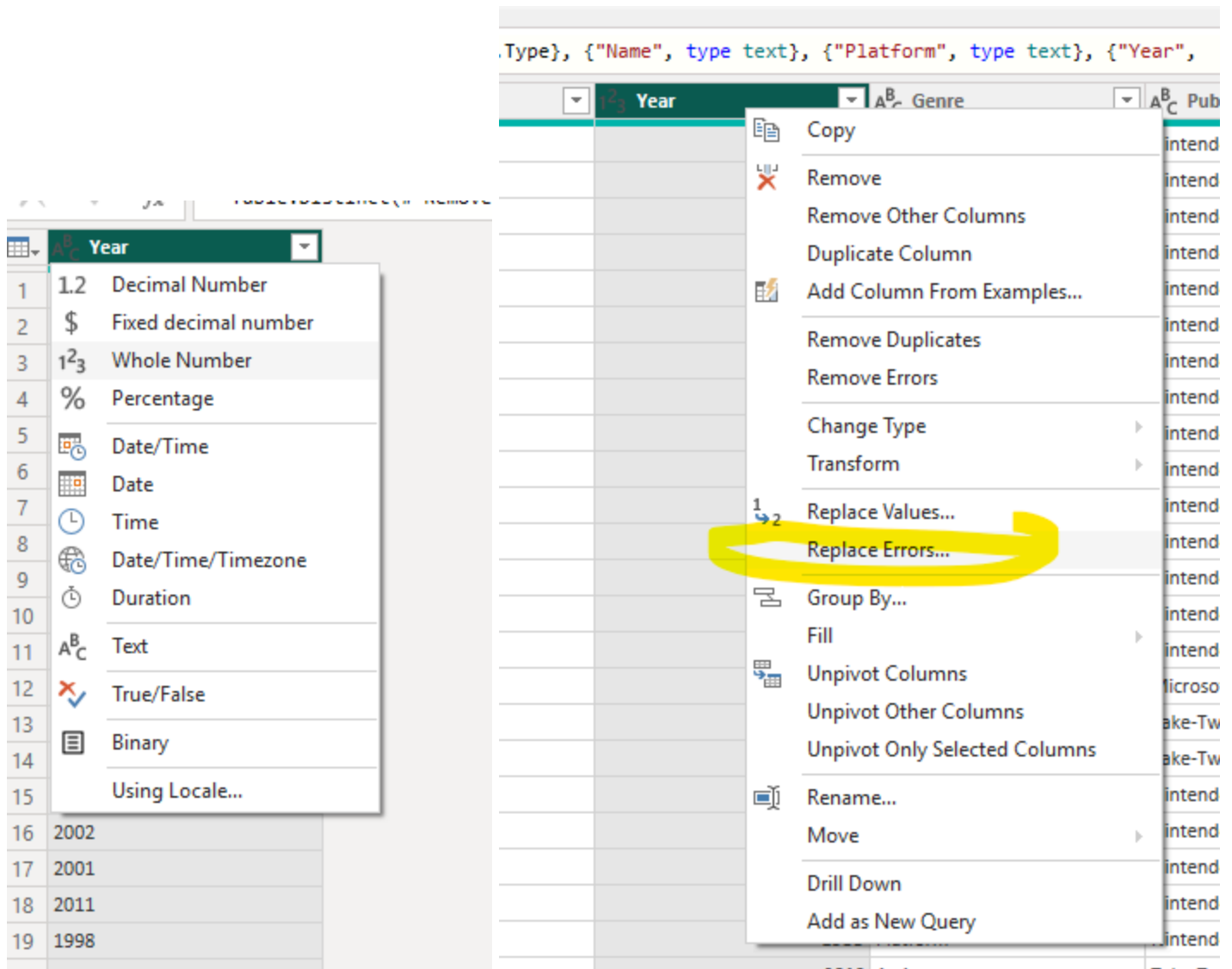
- Copy
- Paste
- Delete
- Rename
- Enable load
- Include in report refresh
- Duplicate
- Reference**
- Move To Group
- Move Up
- Move Down
- Create Function...
- Convert To Parameter
- Advanced Editor
- Properties...

, Order.Ascending)))

| | Platform | Year | Genre |
|----|----------|------|--------------|
| 1 | Wii | | ports |
| 2 | NES | | platform |
| 3 | Wii | | cing |
| 4 | Wii | | ports |
| 5 | GB | | le-Playing |
| 6 | GB | | zzle |
| 7 | DS | | atform |
| 8 | Wii | | sc |
| 9 | Wii | | atform |
| 10 | NES | | ooter |
| 11 | DS | | ulation |
| 12 | DS | | cing |
| 13 | GB | | le-Playing |
| 14 | Wii | | ports |
| 15 | Wii | | ports |
| 16 | X360 | | sc |
| 17 | PS3 | | tion |
| 18 | PS2 | | tion |
| 19 | SNES | | atform |
| 20 | DS | | sc |
| 21 | DS | | le-Playing |
| 22 | GB | | atform |
| 23 | NES | | atform |
| 24 | X360 | 2010 | Action |
| 25 | PS2 | 2002 | Action |
| 26 | GBA | 2002 | Role-Playing |
| 27 | DS | 2010 | Role-Playing |



in the vgsales table



Replace Errors

Enter the value which will replace errors in the selected columns.

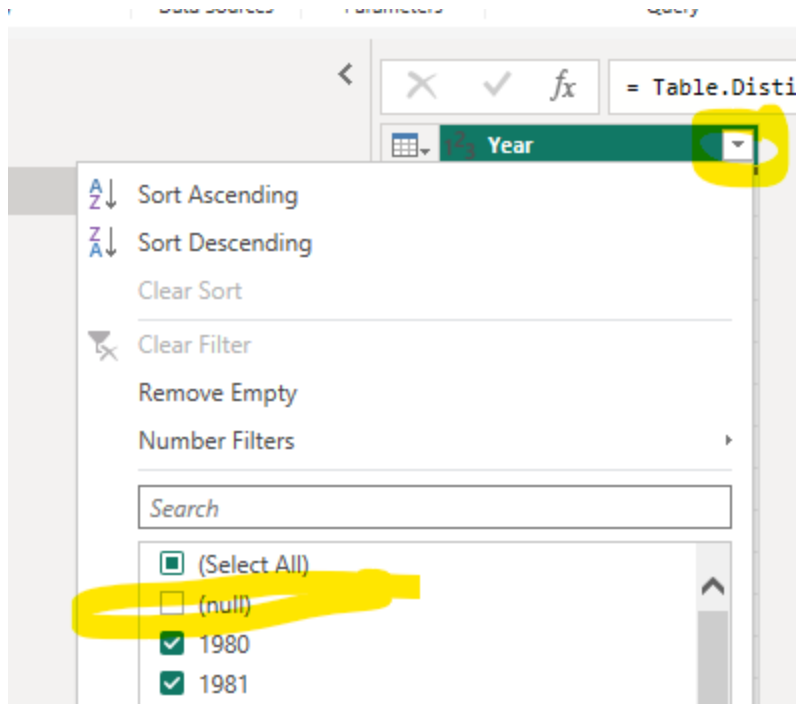
Value

null

OK

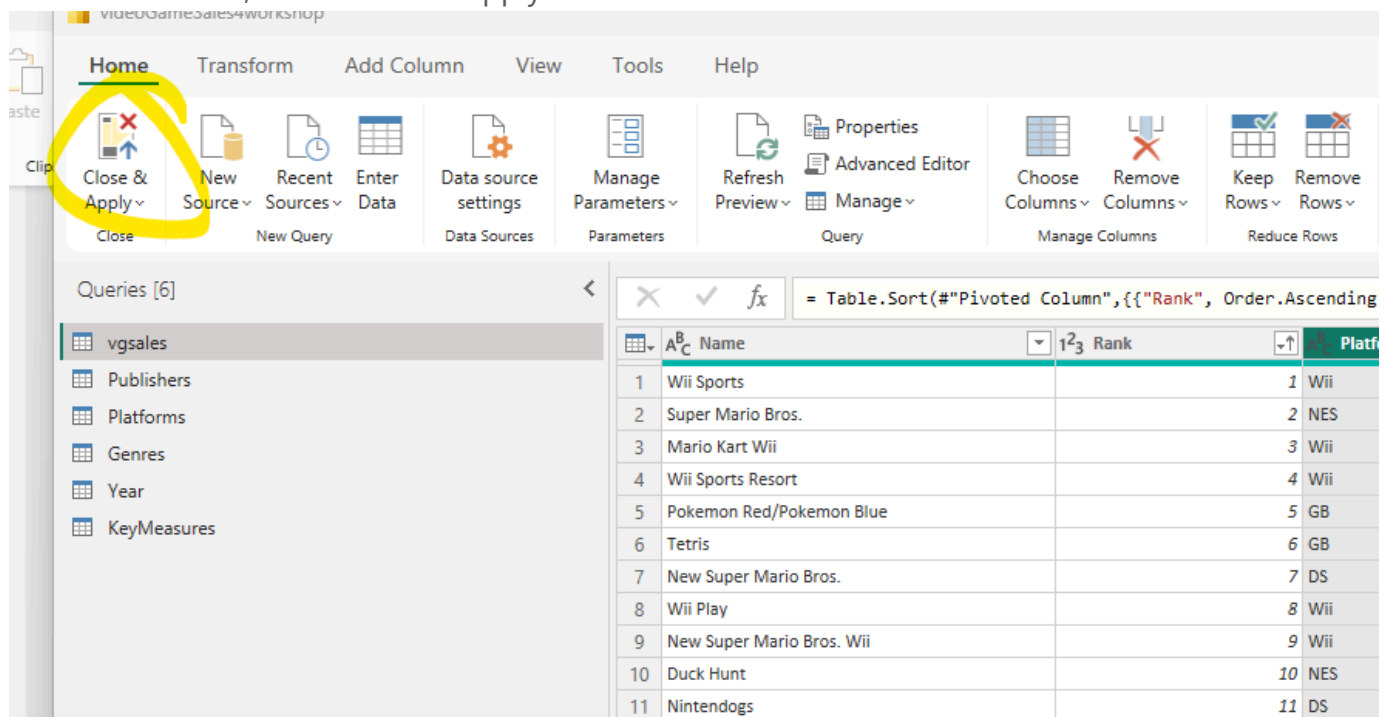
Cancel

in the Years table

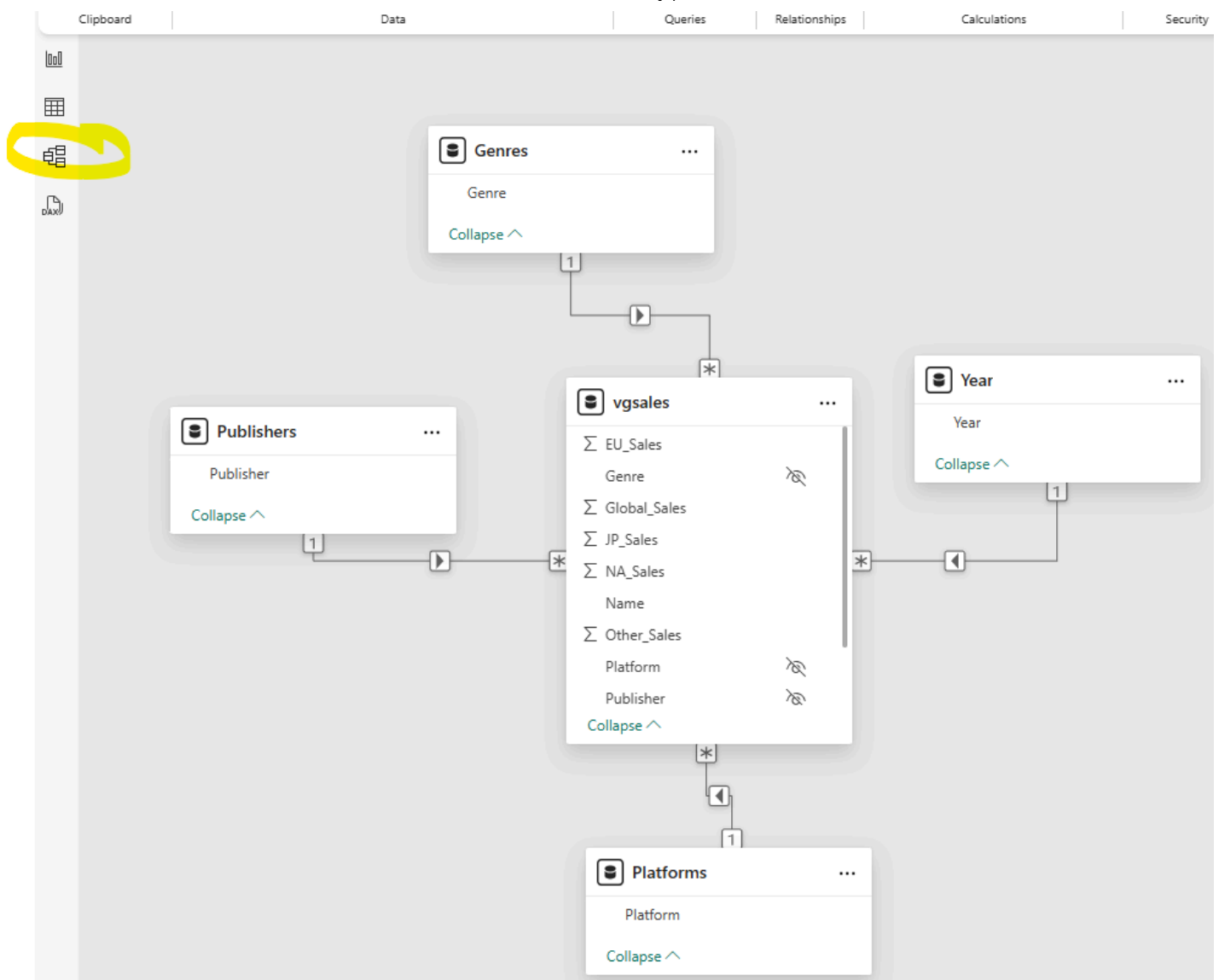


Step 3: load in the data and check the model

- on the home tab, click "Close & Apply"



- check out the "star" schema that should have auto created under the model tab in the Power BI editor



Looking at the model

notice the connecting lines in the schema show a 1-to-many relationship (1 at one end and * at the other end) and have an arrow in the centre of the line, that shows the direction of the relationship. We have all 1-to-many relationships, which is what we want.

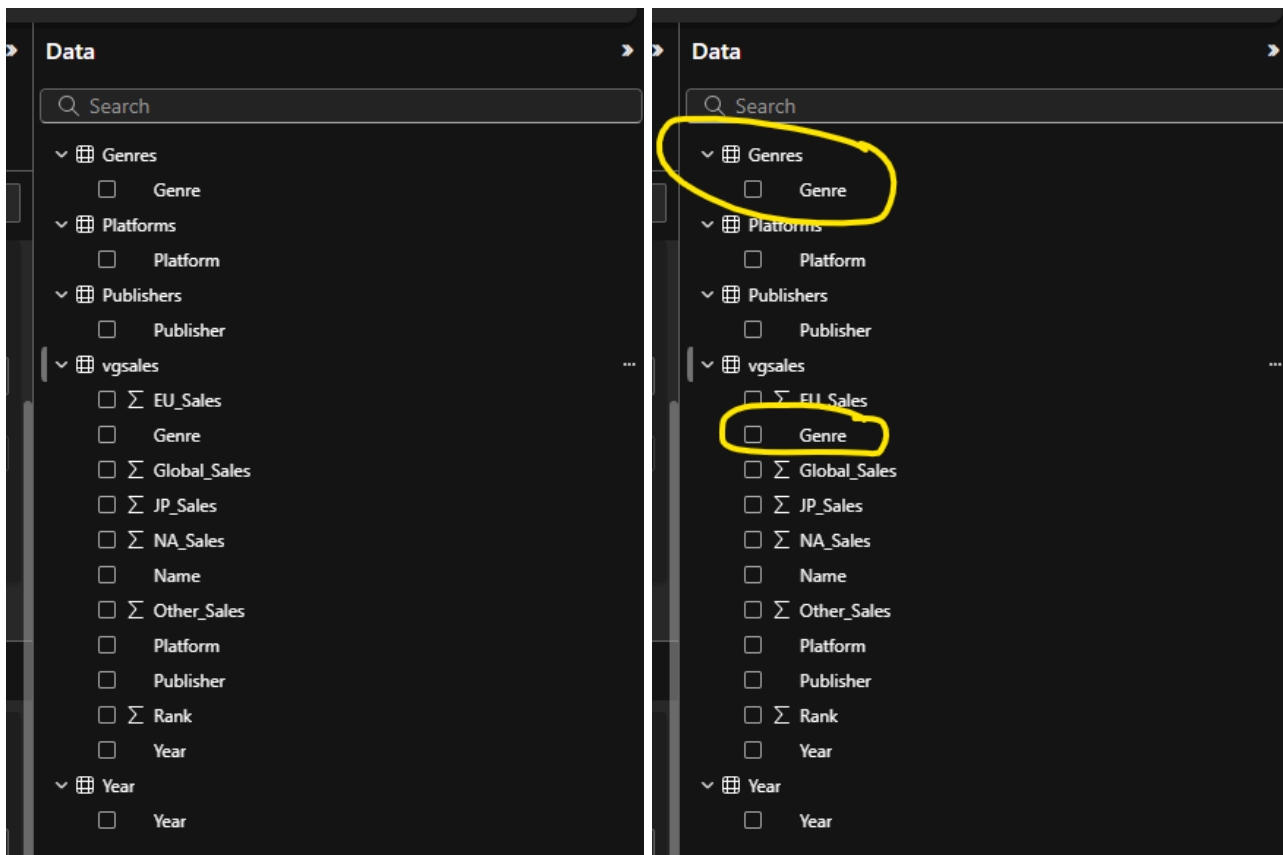
NEXT STEP: Dax

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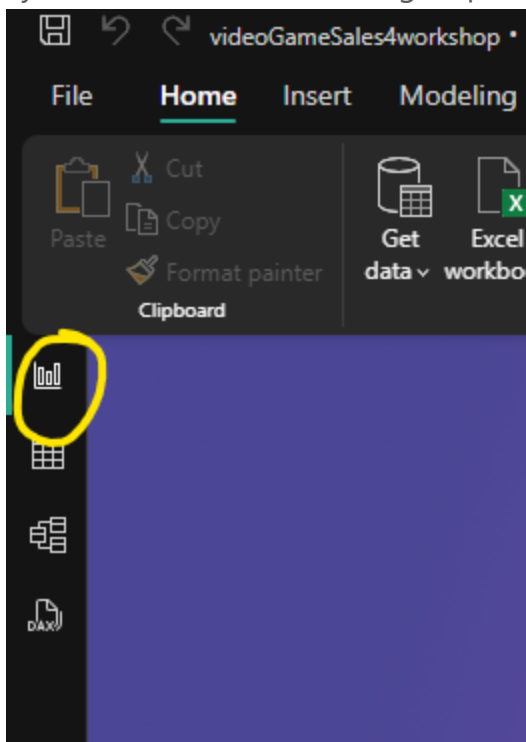
Part 2 DAX

If you expand all the tables in your data pane (located on the right-hand side of the window), your data should look like this. Notice that you now have duplicated columns. We need those for connections, but not to build our measures and visualizations with.



Step 1: We are going to hide the duplicated columns from the vgsales table, so we don't accidentally use the wrong ones.

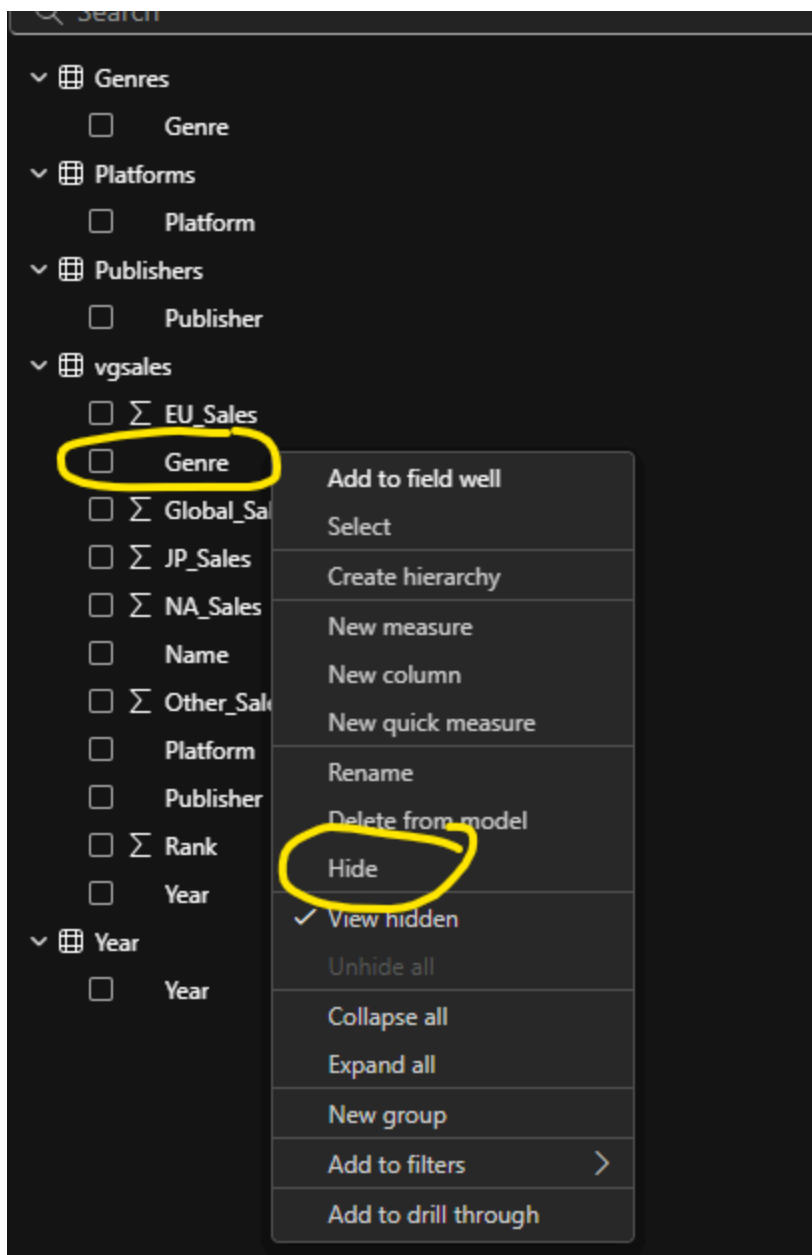
NOTE: you should do the following steps in the "Report view" for the drop-down options you

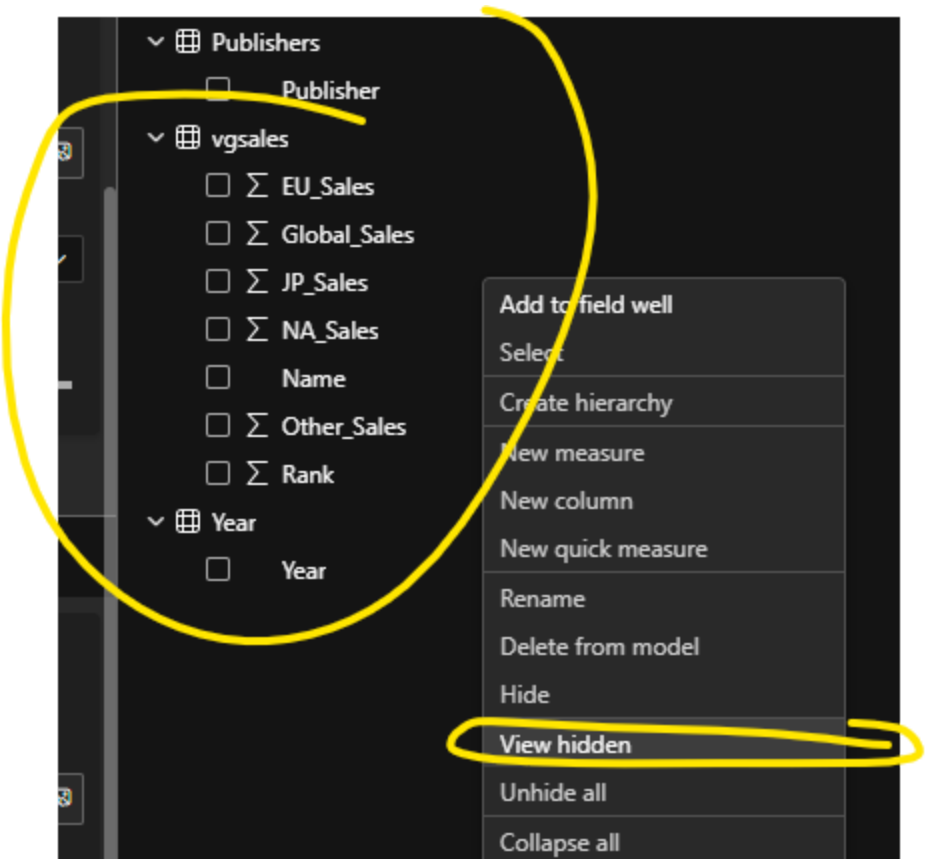
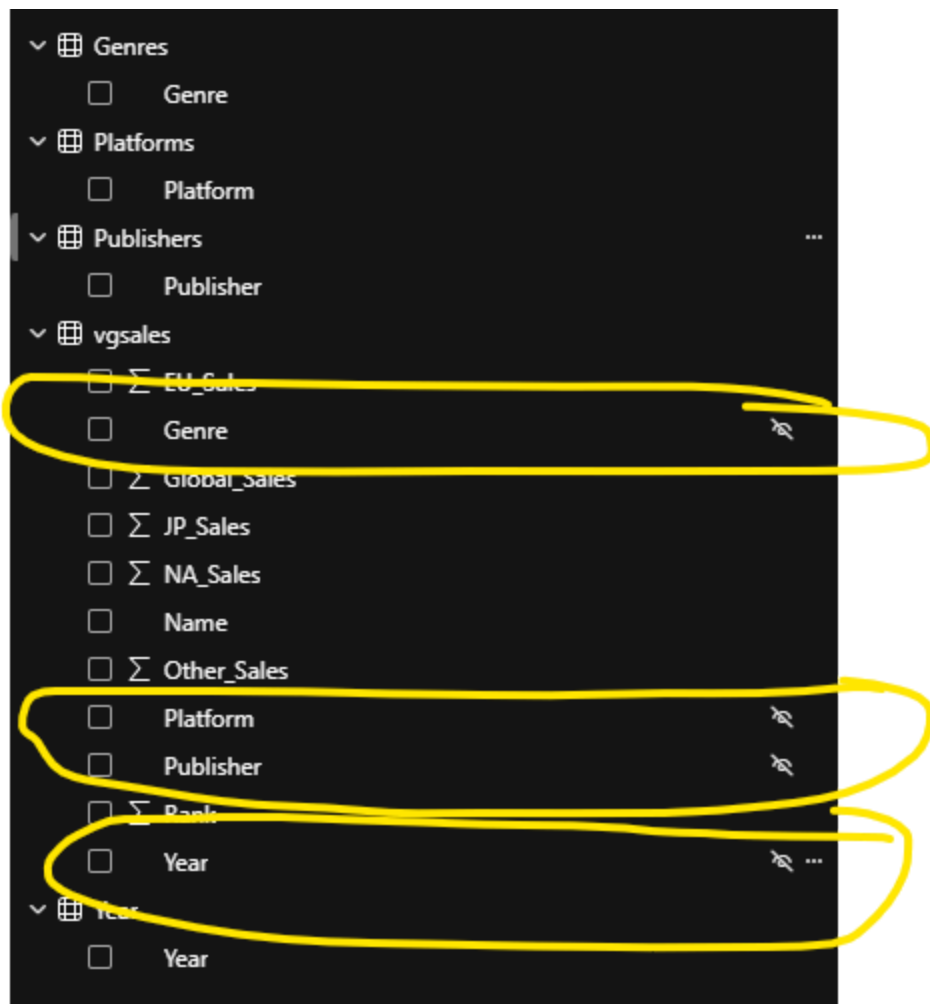


need

- 1 right click on genre and select hide from the drop-down menu. do the same for all the columns that were added to dimension tables
- 2 right click anywhere in the "Data" Pane and make sure "view hidden" is unselected

▼ **Click here for help with step 2**





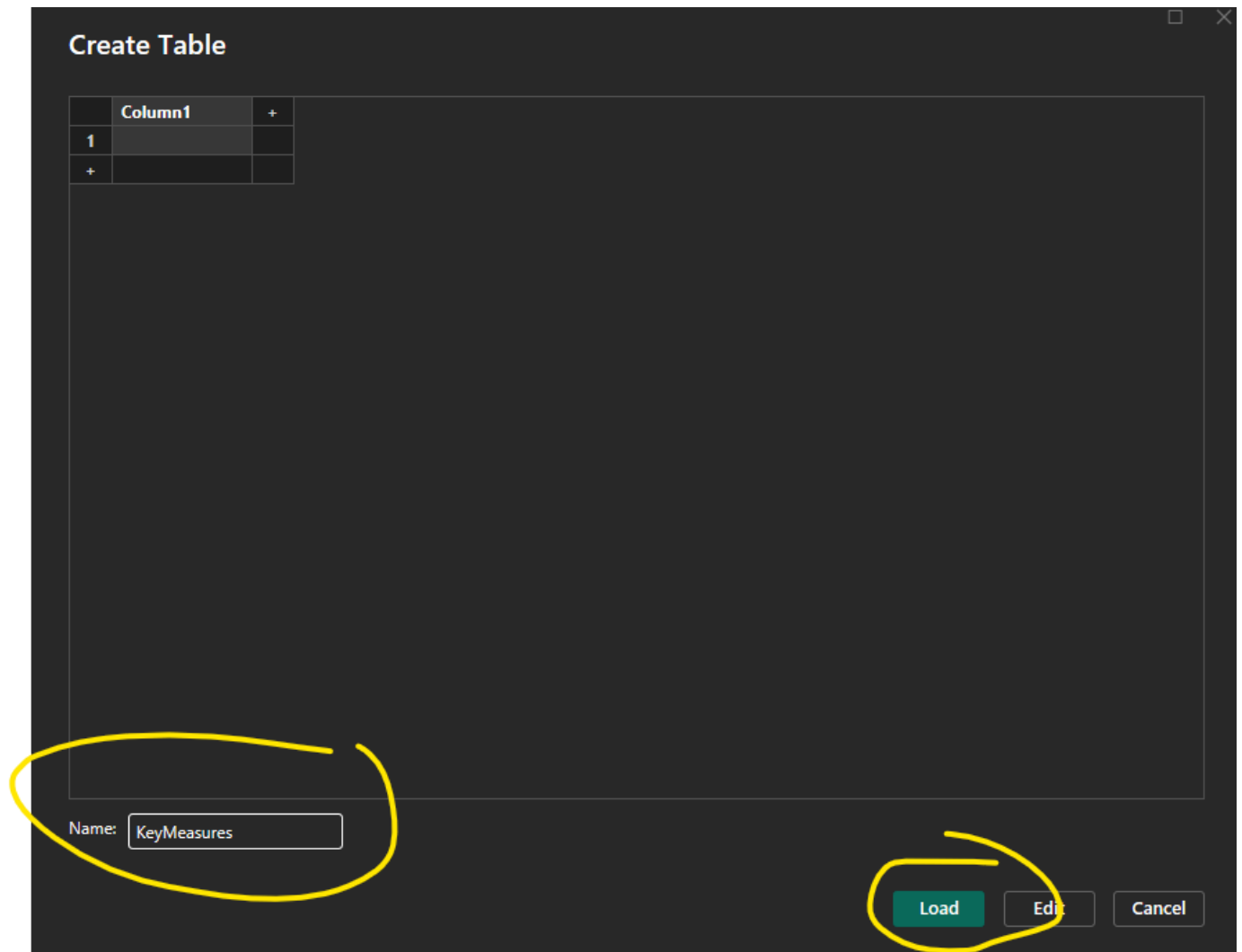
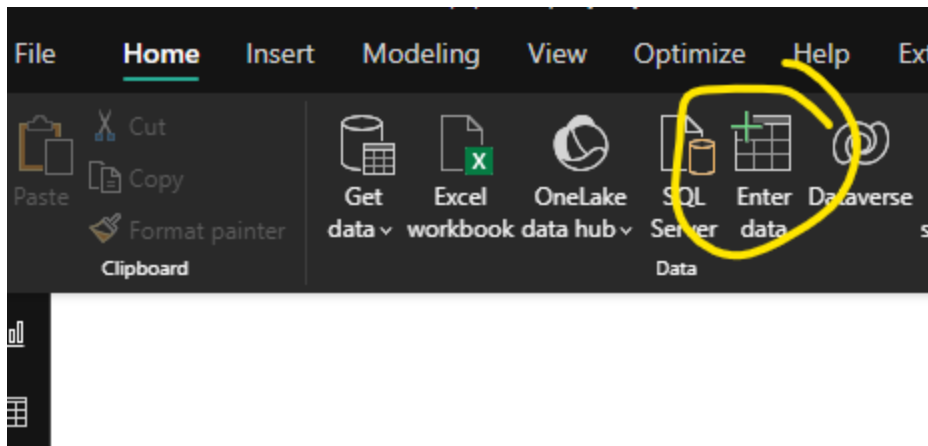
Step 2: Create a measures table. It's best practice to keep a table with only measures in it.

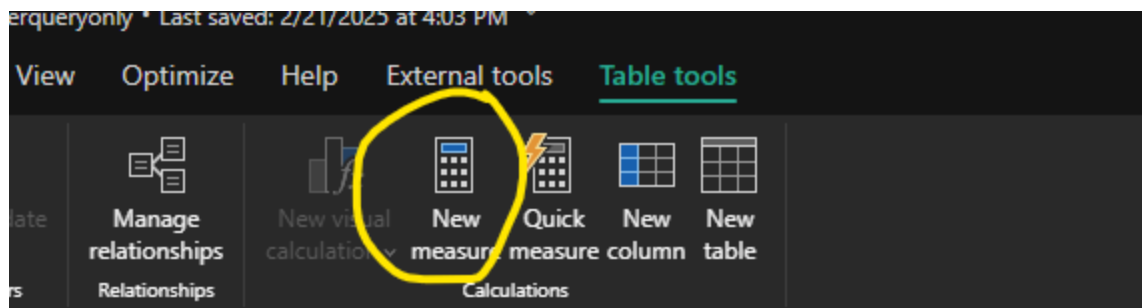
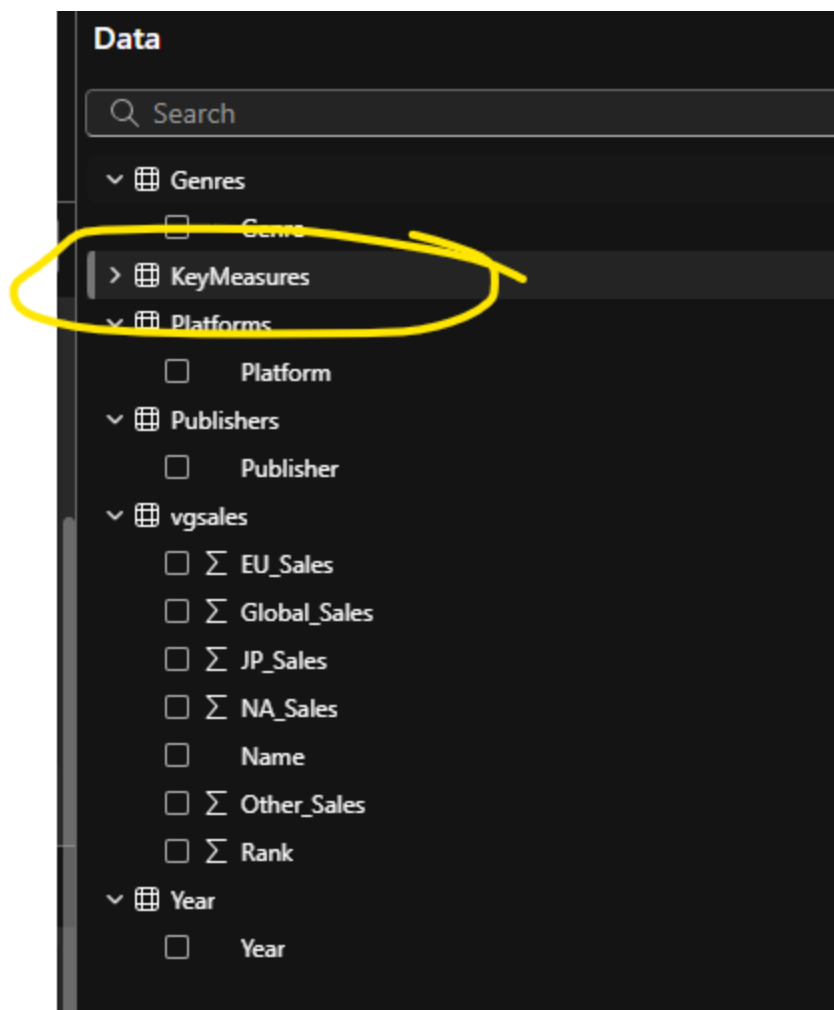
A "measure" in Power BI is a custom calculation that performs calculations on your data, dynamically aggregating values from one or more columns

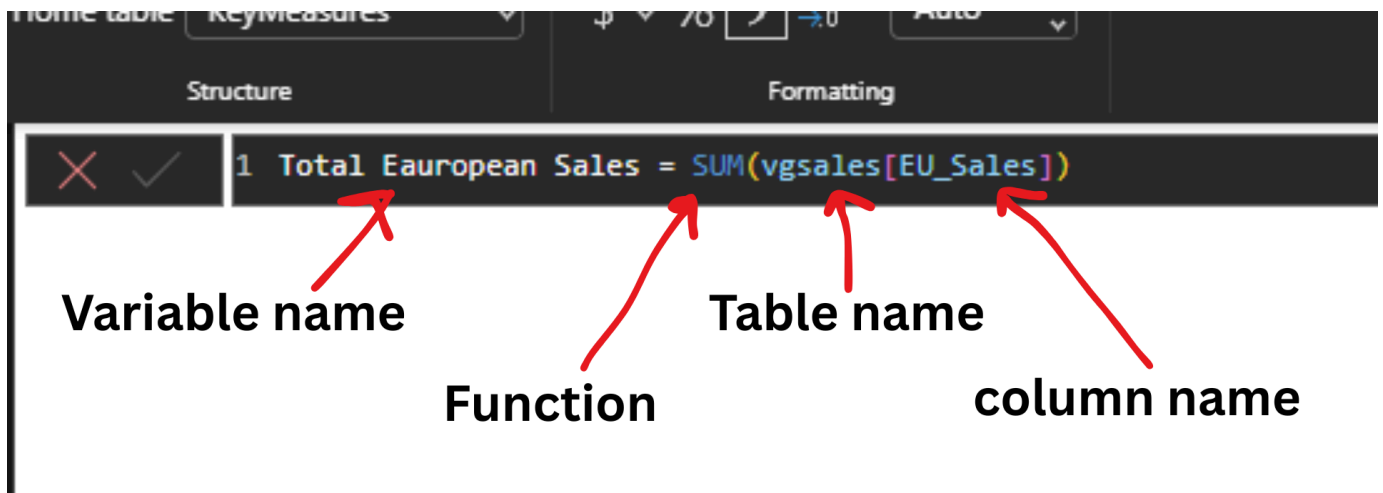
- 1 on the home tab, choose "Enter Data" from the top pane
- 2 don't change anything in the table, but rename it "KeyMeasures"
- 3 click the "Load" button
- 4 in the "Data" pane select the table by clicking the table name
- 5 under the "Table tools" tab, select "new measure" a dialogue box will appear. In the box you can write a measure.
- 6 make a measure for the sum of European sales:

European Sales = SUM(vgsales[EU_Sales]) click the green checkmark or enter when you are done.

▼ **Click here for help with parts 1-6**

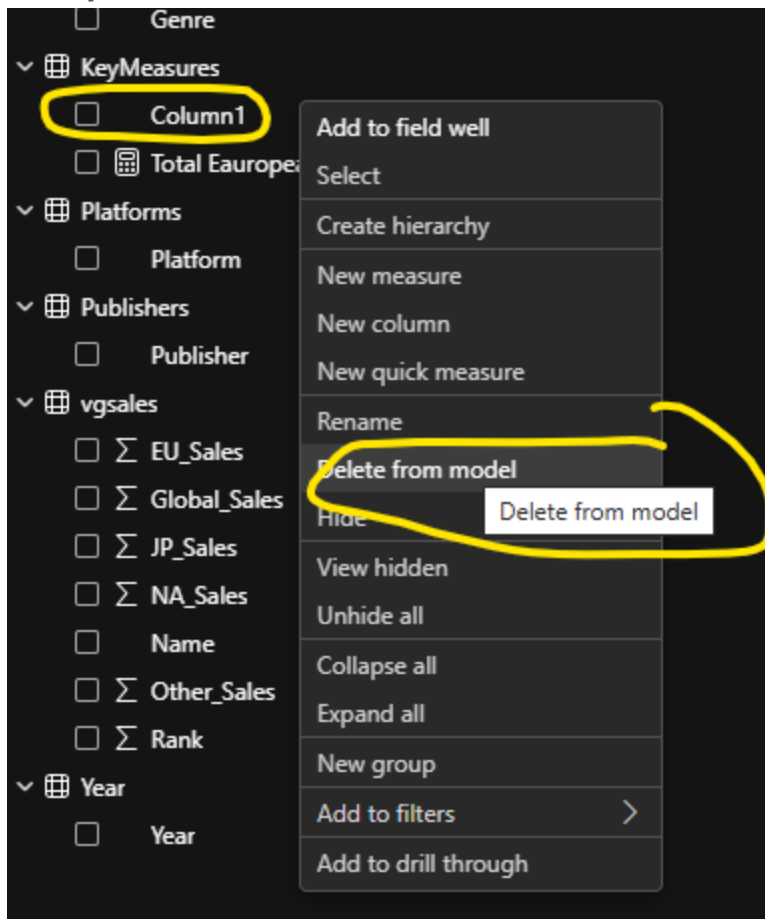




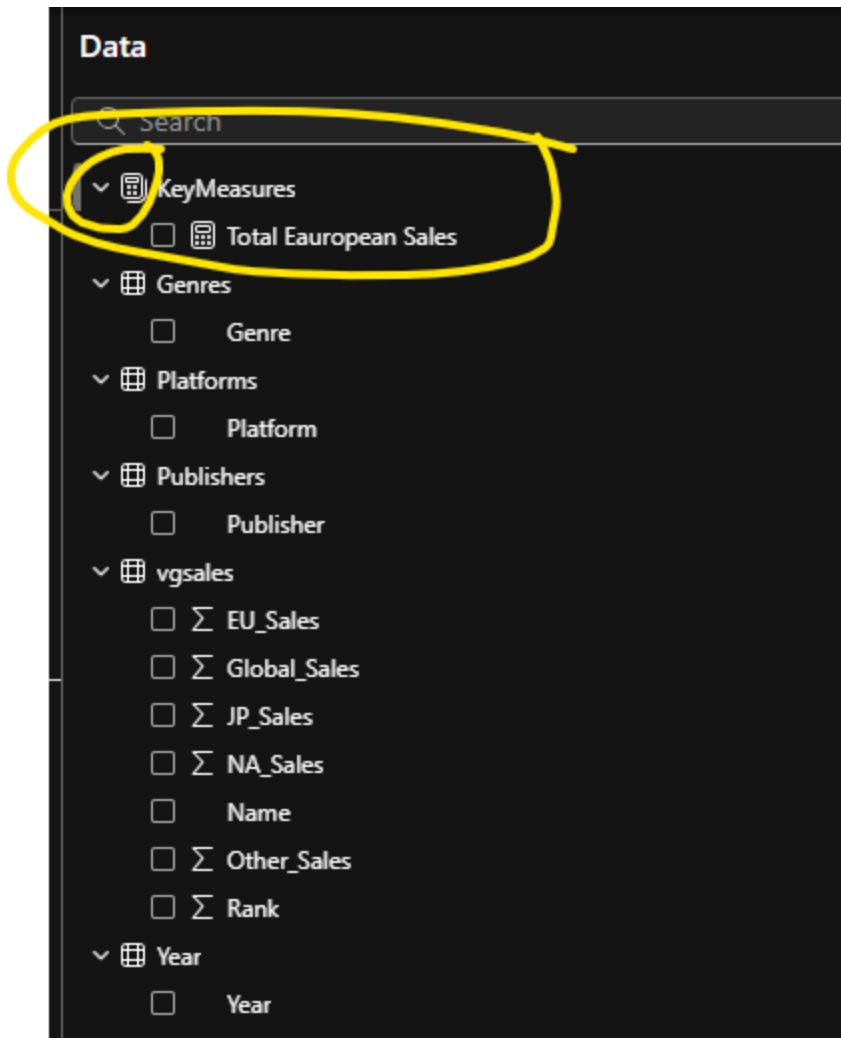


- 7 in the *KeyMeasure* column, delete column1 by right clicking on the column name and selecting "Delete from model".

▼ help



Notice how the table name moves to the top of the "Data" Pane and the icon changed. PowerBI now officially recognizes it as a measure table.



8 Make a measure for each of the following, each time selecting New Measure

- SUM of global sales
- SUM of Japanese sales
- SUM of North American Sales
- DISTINCTCOUNT of name (the number of unique games)
- SUM of other sales
- AVERAGE rank

▼ **Click here for help with DAX codes for part 7**

```
Global Sales = SUM(vgsales[Global_sales])
```

```
Japanese Sales = SUM(vgsales[JP_Sales])
```

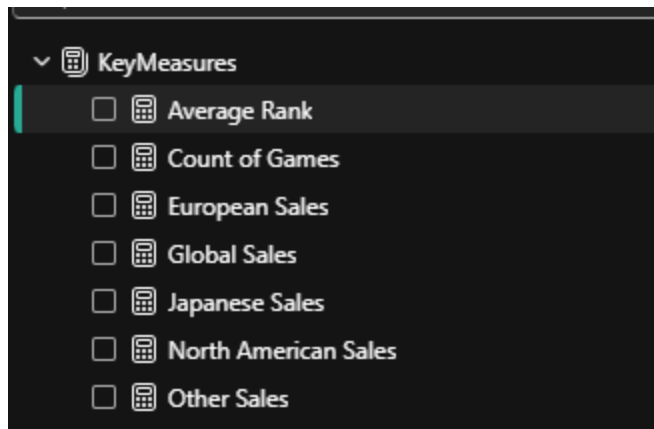
```
North American Sales = SUM(vgsales[NA_Sales])
```

```
Count of Games = DISTINCTCOUNT(vgsales[Name])
```

```
Other Sales = SUM(vgsales[Other_Sales])
```

```
Average Rank = AVERAGE(vgsales[Rank])
```

By the end of these steps you should have a measures table that looks like this:



NEXT STEP: Visualizations

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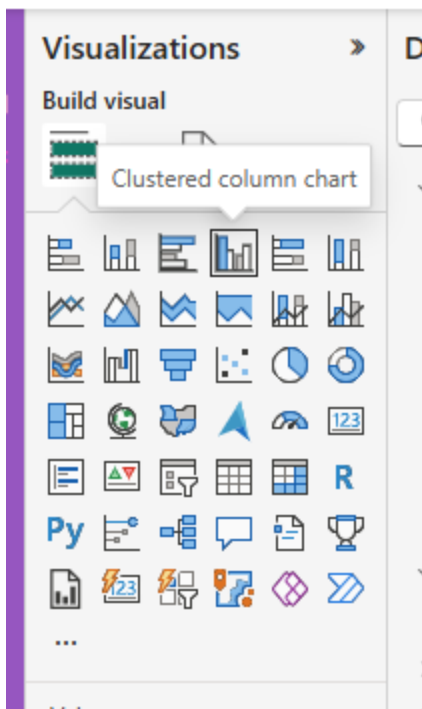
Introduction to Power BI

[Workshop Activities](#) / 3 Visualizations

Part 3 Visualizations

In this visualization stage, you have more freedom to play around, as you have now formatted your data to work well within the visualizations.

The visualization pane shows icons representing the different visualizations. If you hover over an icon, the name of the visualization shows in the tooltip.

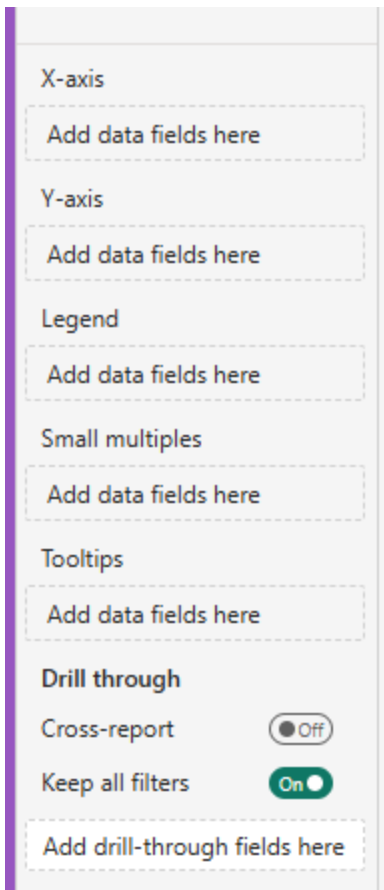


Step 1: add the data to a visualization

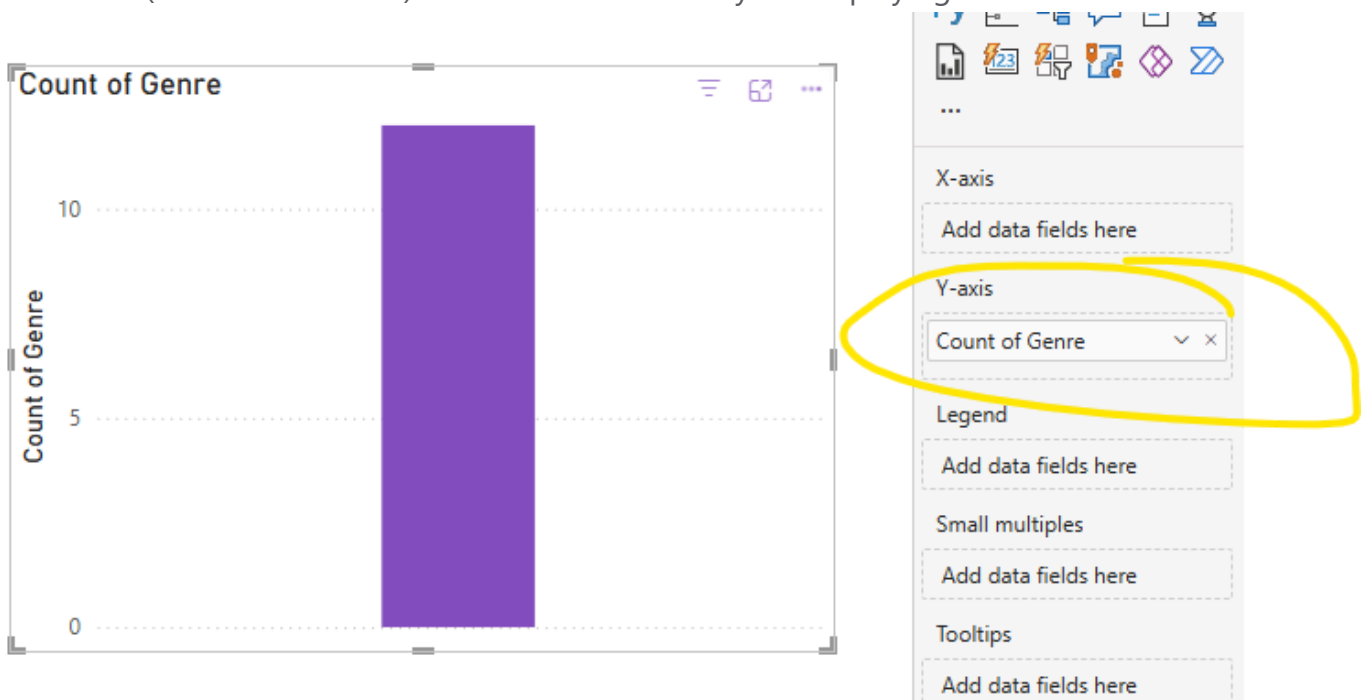
- 1 click on an icon from the visualizations pane.

NOTE: I would suggest one of the first 4 bar charts, the line chart or one of the pie charts to start, as they are the easiest to work with. In the example below, I use the clustered column chart.

- 2 take a look at the field boxes that appear in the visualization pane when you create a visualization. Each of these boxes either expects a measure (ie Global Sales), or a field value (ie Genre).



NOTE: if a measure is expected, but you drag a field in, it might automatically convert the field to a measure (ie Count of Genre). Watch out for that as you are playing around.



- drag measures and fields from the data pane into the data field boxes in the visualizations pane. Play with moving the data around and adding different data to see what happens.

NOTE: your visualization should have at least one measure from your KeyMeasures table, or the fields won't properly connect with each other. This is because of the way we built our model (and the directions of the relationships)

► **Click here for a video to help you through step 1**

Find all Links and videos at uvcilibraries.github.io/PowerBI/all-links.html

Step 2: format your visualization

Once your visualization contains the data you'd like it to, you can add more formatting to improve it.

- 1 with your visualization selected, select the second icon under "Build Visual" in the "Visualizations" pane (it looks like a bar chart with a paint brush)
- 2 Play around with the formatting in the "Visual" section. You can do things like:

- change the axes ranges
- change the axis label font
- change the bar, line, or slice colours
- add labels
- add or remove grid lines

Find all Links and videos at uvcilibraries.github.io/PowerBI/all-links.html

► **Click here for a video to help you with formatting in the "visual" section**

- 3 there is also a section called "General". This is the same for all visualizations. You can do things like:
 - change and format the title
 - add backgrounds
 - change the tooltip source
 - add alt text

► **Click here for a video to help you with formatting in the "General" section**

Find all Links and videos at uvcilibraries.github.io/PowerBI/all-links.html

Step 3: adding more visualizations

- 1 add a slicer type visualization. The slicer expects a dimension (the points of the star). Measures will not work.

► **Click here for a video to help you create and format a slicer**

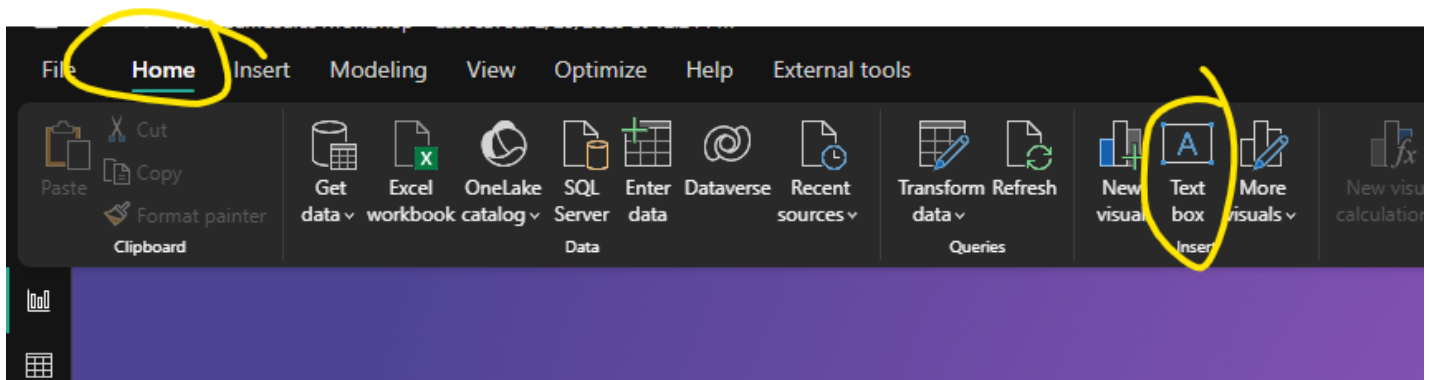
Find all Links and videos at uvcilibraries.github.io/PowerBI/all-links.html

- 2 add more visualizations to your page. Try exploring different measures and categories in your various visualizations.

If you'd like, check out the [LibGuide on visualization best practices](#)

Find all Links and videos at uvcilibraries.github.io/PowerBI/all-links.html

- 1 Add a title and description to your report using a text box



- 1 Don't forget to save your file!

Congrats, you're done the workshop!

NEXT STEP: Additional Resources

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