Microsoft Power Tools for Data Analysis #23
Data Models: Two Fact Tables Into One Fact Table, Excel, DAX or Power Query?
Notes from Video:

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1) **Fundamental Problem with Two Fact Tables**: :

i. Here are pictures of the two Fact Tables from our start file named "EMT1493Start.xlsx":

1. This Fact Table has an Invoice Level Grain, where the Shipping and Discount Amounts are for the whole invoice:

fInvoiceHeader = Invoice Fact Table = Invoice Level
Dimention Table for fLineItemInvoiceDetail
One Side for fLineItemInvoiceDetail Fact Table

Date	Invoice Number	Invoice Shipping	Invoice Discount
1/1/17	125447	98.7	144.18
1/2/17	125448	26.25	73.06
1/3/17	125450	207.55	437.62
1/4/17	125451	262.15	542.26

2. This Fact Table has an Invoice Line Grain (or Product Grain), where the Units and Price Amounts for individual lines in an invoice:

fLineItemInvoiceDetail = Line Item Invoice Detail Fact Table = Line Item Level
Fact Table for fInvoiceHeader
Fact Table for dProduct

Invoice Number	Product	Quantity	Unit Price
125447	Sunbell	21	22.36
125447	Crested Beaut	88	14.97
125447	Kangaroo	35	12.32
125448	Quad	53	27.57
125450	Carlota Doublers	25	48.75
125450	Crested Beaut	34	16.22
125450	Sunset	200	13.03

ii. The fundamental problem is that you can not use the Invoice Grain Numbers (Shipping and Discount) and the Invoice Grain Numbers (Quantity and Units Price) in the same report with the Product in the Row Area of the report.

iii. If our goal is a report like the one listed below, we must merge the two fact tables, or allocate the Invoice Grain Numbers (Shipping and Discount) down to the Invoice Grain Fact Table.

Product	Sum of Line Discount	Sum of Line Shipping
Aspen	$14,970.04	$5,478.60
Carlota	$15,346.03	$5,427.69
Carlota Doublers	$37,571.46	$7,378.59
Crested Beaut	$11,386.60	$6,268.43
Eagle	$8,166.87	$5,855.60
Kangaroo	$10,028.41	$4,723.41
Majestic Beaut	$14,905.66	$8,703.31
Quad	$22,657.89	$3,483.46
Sunbell	$14,213.91	$8,200.96
Sunset	$13,958.21	$7,347.25
Yanaki	$16,178.83	$6,910.81
Grand Total	**$179,383.93**	**$69,778.10**

Product	Sum of Line Discount	Sum of Line Shipping
Aspen	$14,970.04	$5,478.60
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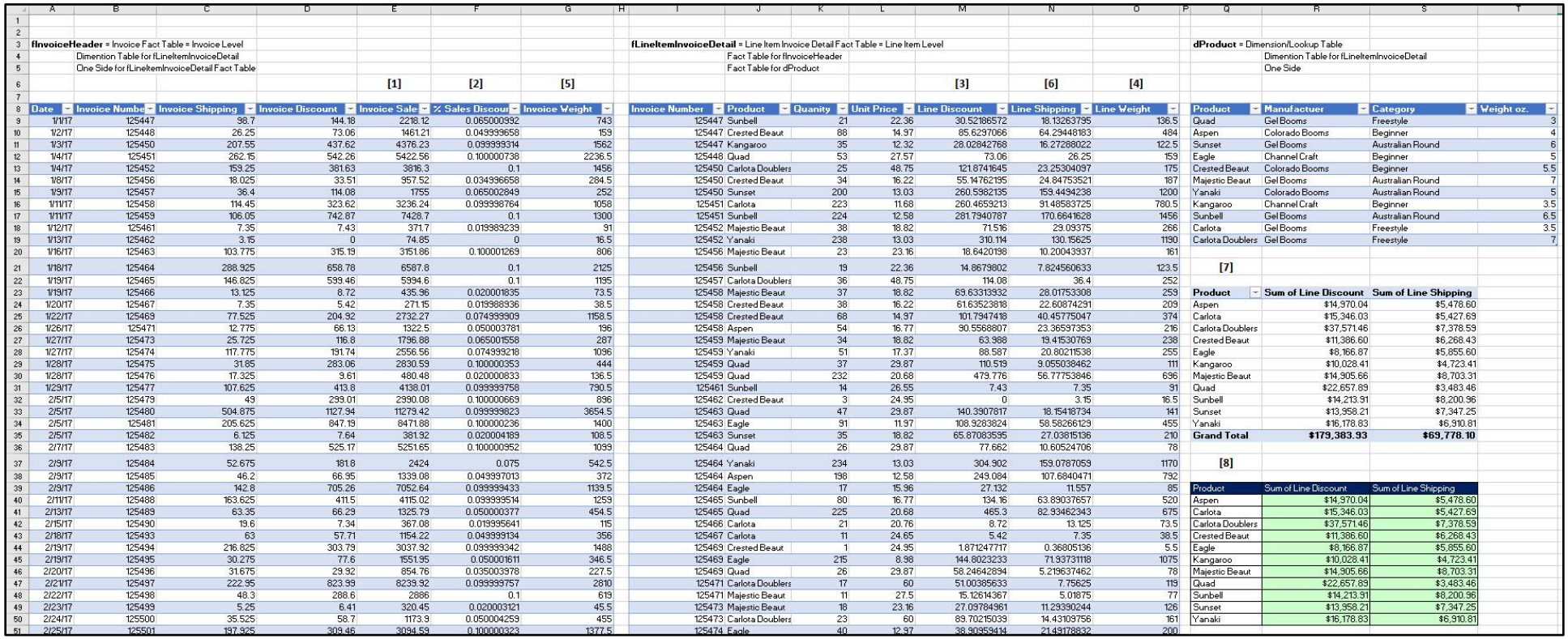
Kangaroo	$10,028.41	$4,723.41
Majestic Beaut	$14,905.66	$8,703.31
Quad	$22,657.89	$3,483.46
Sunbell	$14,213.91	$8,200.96
Sunset	$13,958.21	$7,347.25
Yanaki	$16,178.83	$6,910.81

2) **Excel Worksheet Formula Solution** :

Picture of Final Table with Formula Columns and Final Report:



fInvoiceHeader = Invoice Fact Table = Invoice Level
Dimention Table for fLineItemInvoiceDetail
One Side for fLineItemInvoiceDetail Fact Table

Date	Invoice Number	Invoice Shipping	Invoice Discount	Invoice Sale [1]	% Sales Discount [2]	Invoice Weight [5]
1/1/17	125447	98.7	144.18	2218.12	0.065000992	743
1/2/17	125448	26.25	73.06	1461.21	0.049999658	159
1/3/17	125450	207.55	437.62	4376.23	0.099999314	1562
1/4/17	125451	262.15	542.26	5422.56	0.100000738	2236.5
1/4/17	125452	159.25	381.63	3816.3	0.1	1456
1/8/17	125456	18.025	33.51	957.52	0.034996658	284.5
1/9/17	125457	36.4	114.08	1755	0.065002849	252
1/11/17	125458	114.45	323.62	3236.24	0.099998764	1058
1/11/17	125459	106.05	742.87	7428.7	0.1	1300
1/12/17	125461	7.35	7.43	371.7	0.019989239	91
1/13/17	125462	3.15	0	74.85	0	16.5
1/16/17	125463	103.775	315.19	3151.86	0.100001269	806
1/18/17	125464	288.925	658.78	6587.8	0.1	2125
1/19/17	125465	146.825	599.46	5994.6	0.1	1195
1/19/17	125466	13.125	8.72	435.96	0.020001835	73.5
1/20/17	125467	7.35	5.42	271.15	0.019988936	38.5
1/22/17	125469	77.525	204.92	2732.27	0.074999909	1158.5
1/26/17	125471	12.775	66.13	1322.5	0.050003781	136
1/27/17	125473	25.725	116.8	1796.88	0.065001558	287
1/27/17	125474	117.775	191.74	2556.56	0.074999218	1096
1/28/17	125475	31.85	283.06	2830.59	0.100000353	444
1/28/17	125476	17.325	9.61	480.48	0.020000833	136.5
1/29/17	125477	107.625	413.8	4138.01	0.099999758	790.5
2/5/17	125479	43	239.01	2390.08	0.100000669	896
2/5/17	125480	504.875	1127.94	11279.42	0.099999823	3654.5
2/5/17	125481	205.625	847.19	8471.88	0.100000236	1400
2/5/17	125482	6.125	7.64	381.92	0.020004189	108.5
2/7/17	125483	138.25	525.17	5251.65	0.100000952	1099
2/9/17	125484	52.675	181.8	2424	0.075	542.5
2/9/17	125485	46.2	66.95	1339.08	0.049997013	372
2/9/17	125486	142.8	705.26	7052.64	0.099999433	1139.5
2/11/17	125488	163.625	411.5	4115.02	0.099999514	1259
2/13/17	125489	63.35	66.29	1325.79	0.050000377	454.5
2/15/17	125490	19.6	7.34	367.08	0.019995641	115
2/18/17	125493	63	57.71	1154.22	0.049999134	356
2/19/17	125494	216.825	303.79	3037.92	0.099999342	1488
2/19/17	125495	30.275	77.6	1551.95	0.050001611	346.5
2/20/17	125496	31.675	29.92	854.76	0.035003978	227.5
2/21/17	125497	222.95	823.99	8239.92	0.099999757	2810
2/22/17	125498	48.3	288.6	2886	0.1	619
2/23/17	125499	5.25	6.41	320.45	0.020003121	45.5
2/24/17	125500	35.525	58.7	1173.9	0.050004259	455
2/25/17	125501	197.925	309.46	3094.59	0.100000323	1377.5

fLineItemInvoiceDetail = Line Item Invoice Detail Fact Table = Line Item Level
Fact Table for fInvoiceHeader
Fact Table for dProduct

Invoice Number	Product	Quanity	Unit Price	Line Discount [3]	Line Shipping [6]	Line Weight [4]
125447	Sunbell	21	22.36	30.52186572	18.13263795	136.5
125447	Crested Beaut	88	14.97	85.6297066	64.29448183	484
125447	Kangaroo	35	12.32	28.02842768	16.27288022	122.5
125448	Quad	53	27.57	73.06	26.25	159
125450	Carlota Doublers	25	48.75	121.8741645	23.25304097	175
125450	Crested Beaut	34	16.22	55.14762195	24.84753521	187
125450	Sunset	200	13.03	260.5382135	153.4494238	1200
125451	Carlota	223	11.68	260.4653213	91.48583725	780.5
125451	Sunbell	224	12.58	281.7940787	170.6641628	1456
125452	Majestic Beaut	38	18.82	71.516	29.09375	266
125452	Yanaki	238	13.03	310.114	130.15625	1190
125456	Majestic Beaut	23	23.16	18.6420198	10.20043937	161
125456	Sunbell	19	22.36	14.8679802	7.824560633	123.5
125457	Carlota Doublers	36	48.75	114.08	36.4	252
125458	Majestic Beaut	37	18.82	69.63313932	28.01753308	259
125458	Crested Beaut	38	16.22	61.63523818	22.60874291	209
125458	Crested Beaut	68	14.97	101.7947418	40.45775047	374
125458	Aspen	54	16.77	90.5568807	23.36537353	216
125459	Majestic Beaut	34	18.82	63.988	13.41530769	238
125459	Yanaki	51	17.37	88.587	20.80211538	255
125459	Quad	37	29.87	110.519	9.055038462	111
125459	Quad	232	20.68	479.776	56.77753846	696
125461	Sunbell	14	26.55	7.43	7.35	91
125462	Crested Beaut	3	24.95	0	3.15	16.5
125463	Quad	47	29.87	140.3907817	18.15418734	141
125463	Eagle	91	11.97	108.9283824	58.58266129	455
125463	Sunset	35	18.82	65.87083595	27.03815136	210
125464	Quad	26	29.87	77.662	10.60524706	78
125464	Yanaki	234	13.03	304.902	159.0787059	1170
125464	Aspen	198	12.58	249.084	107.6840471	792
125464	Eagle	17	15.96	27.132	11.557	85
125465	Sunbell	80	16.77	134.16	63.89037657	520
125465	Quad	225	20.68	465.3	82.93462343	675
125466	Carlota	21	20.76	8.72	13.125	73.5
125467	Carlota	11	24.65	5.42	7.35	38.5
125469	Crested Beaut	1	24.95	1.871247717	0.36805136	5.5
125469	Eagle	215	8.98	144.8023233	71.93731118	1075
125469	Quad	26	29.87	58.24642894	5.219637462	78
125471	Carlota Doublers	17	60	51.00385633	7.75625	119
125471	Majestic Beaut	11	27.5	15.12614367	5.01875	77
125473	Majestic Beaut	18	23.16	27.09784961	11.29390244	126
125473	Carlota Doublers	23	60	89.70215039	14.43109756	161
125474	Eagle	40	12.97	38.90959414	21.49178832	200

dProduct = Dimension/Lookup Table
Dimention Table for fLineItemInvoiceDetail
One Side

Product	Manufactuer	Category	Weight oz.
Quad	Gel Booms	Freestyle	3
Aspen	Colorado Booms	Beginner	4
Sunset	Gel Booms	Australian Round	6
Eagle	Channel Craft	Beginner	5
Crested Beaut	Colorado Booms	Beginner	5.5
Majestic Beaut	Gel Booms	Australian Round	7
Yanaki	Colorado Booms	Australian Round	5
Kangaroo	Channel Craft	Beginner	3.5
Sunbell	Gel Booms	Australian Round	6.5
Carlota	Gel Booms	Freestyle	3.5
Carlota Doublers	Gel Booms	Freestyle	7

[7]

Product	Sum of Line Discount	Sum of Line Shipping
Aspen	$14,970.04	$5,478.60
Carlota	$15,346.03	$5,427.69
Carlota Doublers	$37,571.46	$7,378.59
Crested Beaut	$11,386.60	$6,268.43
Eagle	$8,166.87	$5,855.60
Kangaroo	$10,028.41	$4,723.41
Majestic Beaut	$14,905.66	$8,703.31
Quad	$22,657.89	$3,483.46
Sunbell	$14,213.91	$8,200.96
Sunset	$13,958.21	$7,347.25
Yanaki	$16,178.83	$6,910.81
Grand Total	**$179,383.93**	**$69,778.10**

[8]

Product	Sum of Line Discount	Sum of Line Shipping
Aspen	$14,970.04	$5,478.60
Carlota	$15,346.03	$5,427.69
Carlota Doublers	$37,571.46	$7,378.59
Crested Beaut	$11,386.60	$6,268.43
Eagle	$8,166.87	$5,855.60
Kangaroo	$10,028.41	$4,723.41
Majestic Beaut	$14,905.66	$8,703.31
Quad	$22,657.89	$3,483.46
Sunbell	$14,213.91	$8,200.96
Sunset	$13,958.21	$7,347.25
Yanaki	$16,178.83	$6,910.81

1] (05:45 in video) Worksheet Formula for “Invoice Sales” Column in the fInvoiceHeader Fact Table using SUMPRODUCT function, is seen in the below picture:

```
=SUMPRODUCT(fLineItemInvoiceDetail[Quanity],fLineItemInvoiceDetail[Unit Price],
--(fLineItemInvoiceDetail[Invoice Number]=[@[Invoice Number]]))
```

2] (09:23 in video) Worksheet Formula for “% Sales Discount” Column in the fInvoiceHeader Fact Table using division:

```
=[@[Invoice Discount]]/[@[Invoice Sales]]
```

3] (10:00 in video) Worksheet Formula for “Line Discount” Column in the fLineItemInvoiceDetail Fact Table using VLOOKUP and multiplication:

```
=VLOOKUP([@[Invoice Number]],fInvoiceHeader[[Invoice Number]:[% Sales Discount]],5,0)
*[@Quanity]*[@[Unit Price]]
```

4] (13:27 in video) Worksheet Formula for Invoice “Line Weight” Column in the fLineItemInvoiceDetail Fact Table using VLOOKUP and multiplication:

```
=VLOOKUP([@Product],dProduct,4,0)*[@Quanity]
```

5] (14:30 in video) Worksheet Formula for “Invoice Weight” Column in the fInvoiceHeader Fact Table using SUMIFS:

```
=SUMIFS(fLineItemInvoiceDetail[Line Weight],
fLineItemInvoiceDetail[Invoice Number],[@[Invoice Number]])
```

6] (15:04 in video) Worksheet Formula for “Line Shipping” Column in the fLineItemInvoiceDetail Fact Table using VLOOKUP and multiplication

```
=[@[Line Weight]]/
VLOOKUP([@[Invoice Number]],fInvoiceHeader[[Invoice Number]:[Invoice Weight]],6,0)
*VLOOKUP([@[Invoice Number]],fInvoiceHeader[[Invoice Number]:[Invoice Shipping]],2,0)
```

7] (17:03 in video) Standard PivotTable Report

[7]

Product	Sum of Line Discount	Sum of Line Shipping
Aspen	$14,970.04	$5,478.60
Carlota	$15,346.03	$5,427.69
Carlota Doublers	$37,571.46	$7,378.59
Crested Beaut	$11,386.60	$6,268.43
Eagle	$8,166.87	$5,855.60
Kangaroo	$10,028.41	$4,723.41
Majestic Beaut	$14,905.66	$8,703.31
Quad	$22,657.89	$3,483.46
Sunbell	$14,213.91	$8,200.96
Sunset	$13,958.21	$7,347.25
Yanaki	$16,178.83	$6,910.81
Grand Total	**$179,383.93**	**$69,778.10**

8] (17:53 in video) Worksheet Formula Report

[8]

Product	Sum of Line Discount	Sum of Line Shipping
Aspen	=SUMIFS(fLineItemInvoiceDetail[Line Discount],fLineItemInvoiceDetail[[Product]:[Product]],$Q40)	
Carlota		
Carlota Doublers	$37,571.46	$7,378.59
Crested Beaut	$11,386.60	$6,268.43
Eagle	$8,166.87	$5,855.60
Kangaroo	$10,028.41	$4,723.41
Majestic Beaut	$14,905.66	$8,703.31
Quad	$22,657.89	$3,483.46
Sunbell	$14,213.91	$8,200.96
Sunset	$13,958.21	$7,347.25
Yanaki	$16,178.83	$6,910.81

9]

3) DAX Formula Solution in Power Pivot

1] Here is a picture of our three Excel Tables in the Excel Workbook file named "EMT1494Start.xlsx".

fInvoiceHeader = Invoice Fact Table = Invoice Level
Dimention Table for fLineItemInvoiceDetail
One Side for fLineItemInvoiceDetail Fact Table

Date	Invoice Number	Invoice Shipping	Invoice Discount
1/1/17	125447	98.7	144.18
1/2/17	125448	26.25	73.06
1/3/17	125450	207.55	437.62
1/4/17	125451	262.15	542.26
1/4/17	125452	159.25	381.63
1/8/17	125456	18.025	33.51
1/9/17	125457	36.4	114.08
1/11/17	125458	114.45	323.62
1/11/17	125459	106.05	742.87
1/12/17	125461	7.35	7.43
1/13/17	125462	3.15	0
1/16/17	125463	103.775	315.19
1/18/17	125464	288.925	658.78

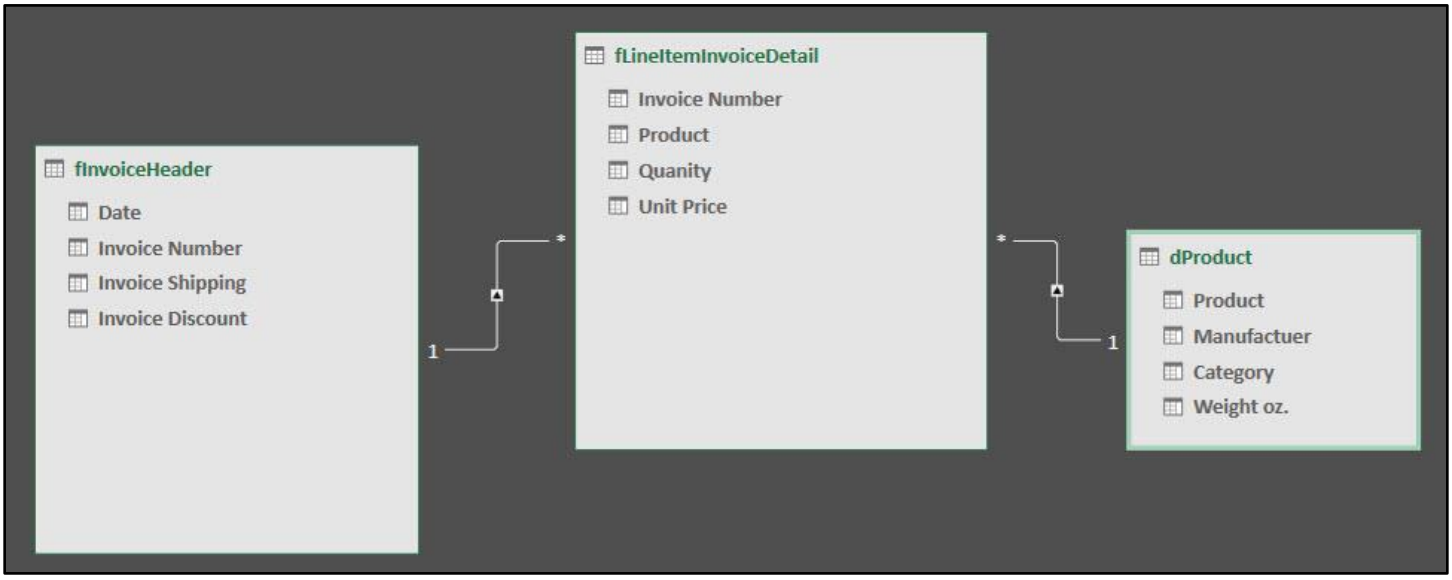
fLineItemInvoiceDetail = Line Item Invoice Detail Fact Table = Line Item Level
Fact Table for fInvoiceHeader
Fact Table for dProduct

Invoice Numbe	Product	Quanity	Unit Price
125447	Sunbell	21	22.36
125447	Crested Beaut	88	14.97
125447	Kangaroo	35	12.32
125448	Quad	53	27.57
125450	Carlota Doubler	25	48.75
125450	Crested Beaut	34	16.22
125450	Sunset	200	13.03
125451	Carlota	223	11.68
125451	Sunbell	224	12.58
125452	Majestic Beaut	38	18.82
125452	Yanaki	238	13.03
125456	Majestic Beaut	23	23.16
125456	Sunbell	19	22.36

dProduct = Dimension/Lookup Table
Dimention Table for fLineItemInvoiceDetail
One Side

Product	Manufactuer	Category	Weight oz.
Quad	Gel Booms	Freestyle	3
Aspen	Colorado Booms	Beginner	4
Sunset	Gel Booms	Australian Round	6
Eagle	Channel Craft	Beginner	5
Crested Beaut	Colorado Booms	Beginner	5.5
Majestic Beaut	Gel Booms	Australian Round	7
Yanaki	Colorado Booms	Australian Round	5
Kangaroo	Channel Craft	Beginner	3.5
Sunbell	Gel Booms	Australian Round	6.5
Carlota	Gel Booms	Freestyle	3.5
Carlota Doublers	Gel Booms	Freestyle	7

2] After you import the Excel Tables into the Power Pivot Data Model and create relationships, the staring Data Model looks like this:



3] Picture of Finished fInvoiceHeader Fact Table with DAX Calculated Columns:

	Date	Invoice Nu...	Invoice Discount	Invoice Shipping	Invoice Sales	% Invoice Discount	Invoice Weight
1	1/1/17 ...	125447	144.18	98.7	2218.12	0.0650009918309199	743
2	1/2/17 ...	125448	73.06	26.25	1461.21	0.0499996578178359	159
3	1/3/17 ...	125450	437.62	207.55	4376.23	0.0999993144784438	1562
4	1/4/17 ...	125451	542.26	262.15	5422.56	0.100000737658966	2236.5
5	1/4/17 ...	125452	381.63	159.25	3816.3	0.1	1456
6	1/8/17 ...	125456	33.51	18.025	957.52	0.0349966580332526	284.5
7	1/9/17 ...	125457	114.08	36.4	1755	0.065002849002849	252
8	1/11/1...	125458	323.62	114.45	3236.24	0.0999987639977258	1058
9	1/11/1	125459	742.87	106.05	7428.7	0.1	1300

4] Picture of Finished fLineItemInvoiceDetail Fact Table with DAX Calculated Columns & DAX Measures:

	Invoice Nu...	Product	Quanity	Unit Price	Line Discount	Line Shipping
1	125447	Sunbell	21	22.36	30.5218657241267	18.1326379542396
2	125447	Crested Beaut	88	14.97	85.6297065983806	64.2944818304172
3	125447	Kangaroo	35	12.32	28.0284276774927	16.2728802153432
4	125448	Quad	53	27.57	73.06	26.25
5	125450	Carlota Doublers	25	48.75	121.874164520603	23.2530409731114
6	125450	Crested Beaut	34	16.22	55.1476219485722	24.8475352112676
7	125450	Sunset	200	13.03	260.598213530824	159.449423815621
8	125451	Carlota	223	11.68	260.465921336048	91.4858372456964
9	125451	Sunbell	224	12.58	281.794078663952	170.664162754304
10	125452	Majestic Beaut	38	18.82	71.516	29.09375
11	125452	Yanaki	238	13.03	310.114	130.15625
12	125456	Majestic Beaut	23	23.16	18.642019801153	10.2004393673111
					Discount On Invoice: $179,383.93	
					Shipping On Invoice: $69,778.10	

5] (26:56 in video) DAX Calculated Column Formula for “Invoice Sales” Column in the fInvoiceHeader Fact Table using SUMX and RELATEDTABLE functions:

```
=SUMX(RELATEDTABLE(fLineItemInvoiceDetail),
fLineItemInvoiceDetail[Unit Price]*fLineItemInvoiceDetail[Quanity])
```

6] (29:40 in video) DAX Calculated Column Formula for “% Invoice Discount” Column in the fInvoiceHeader Fact Table using DIVIDE function:

```
=DIVIDE(fInvoiceHeader[Invoice Discount],fInvoiceHeader[Invoice Sales])
```

7] (30:50 in video) DAX Calculated Column Formula for “Line Discount” Column in the fLineItemInvoiceDetail Fact Table using RELATED function and multiplication:

```
=RELATED(fInvoiceHeader[% Invoice Discount])
*fLineItemInvoiceDetail[Quanity]*fLineItemInvoiceDetail[Unit Price]
```

8] (31:57 in video) DAX Measure for “Discount On Invoice” in the Measure Grid below the fInvoiceHeader Fact Table:

```
Discount On Invoice:=SUM(fLineItemInvoiceDetail[Line Discount])
```

9] (34:22 in video) DAX Calculated Column Formula for “Invoice Weight” Column in the fInvoiceHeader Fact Table using SUMX, RELATEDTABLE and RELATED:

```
=SUMX(RELATEDTABLE(fLineItemInvoiceDetail),
fLineItemInvoiceDetail[Quanity]*RELATED(dProduct[Weight oz.]))
```

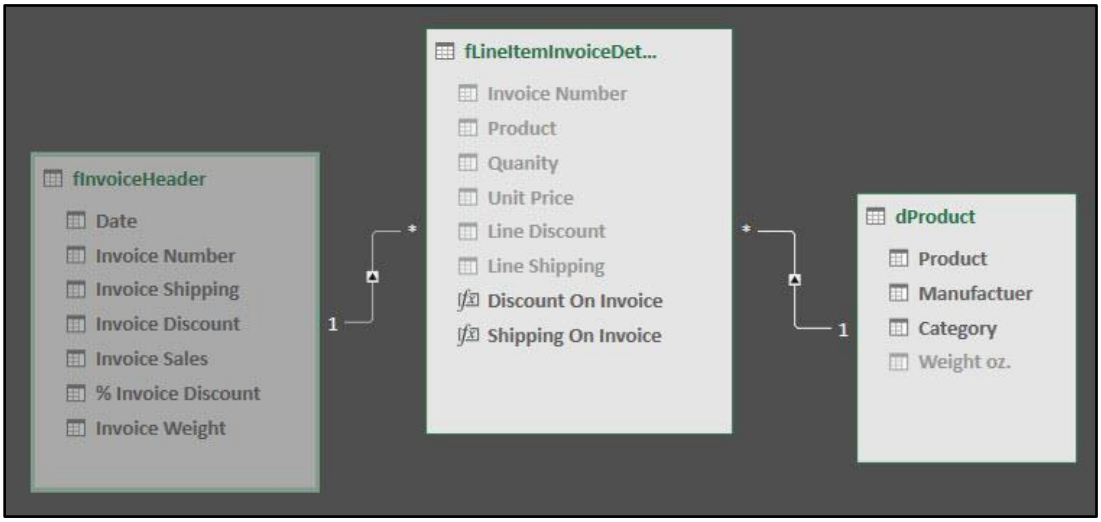
10] (36:52 in video) DAX Calculated Column Formula for “Line Shipping” Column in the fLineItemInvoiceDetail Fact Table using RELATED and multiplication and division. Three RELATED function in one formula:

```
=(fLineItemInvoiceDetail[Quanity]*RELATED(dProduct[Weight oz.]))/
RELATED(fInvoiceHeader[Invoice Weight])
*RELATED(fInvoiceHeader[Invoice Shipping])
```

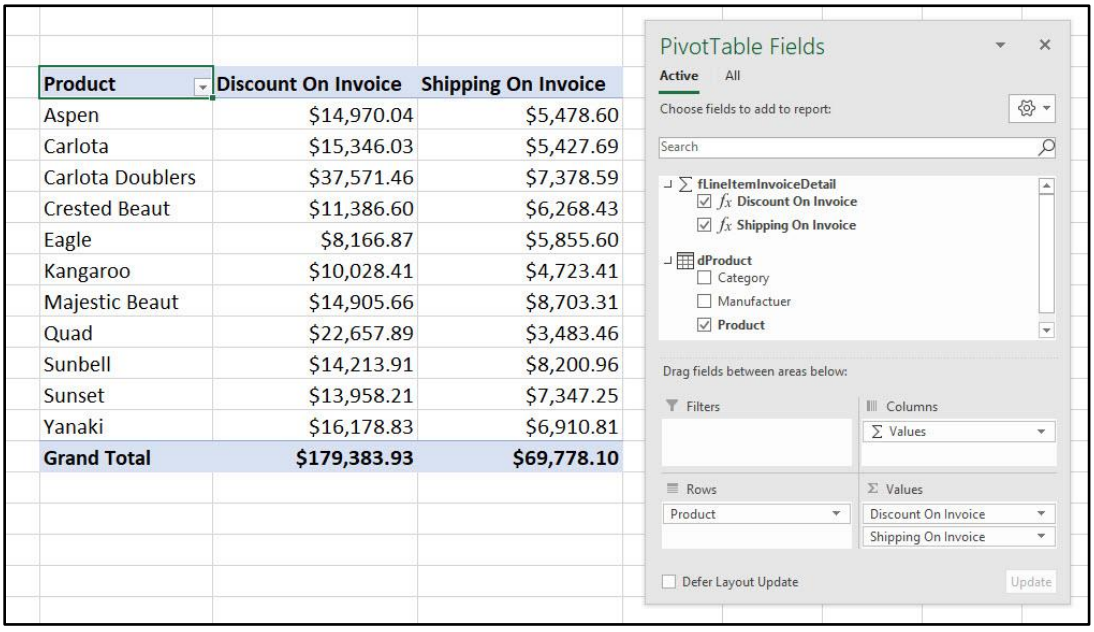
11] (39:03 in video) DAX Measure for Total Shipping in the Measure Grid below the fInvoiceHeader Fact Table:

```
Shipping On Invoice:=SUM(fLineItemInvoiceDetail[Line Shipping])
```

12] Note: In video we did not hide columns that were not required in PivotTable Area, and we did not hide the fInvoiceHeader Fact Table. In Design view in the Power Pivot window you can right-click each element and click on “Hide In Client Tool”. If you do that, the final Data Model would look like this:



13] (39:25 in video) Final Data Model PivotTable looks like this:

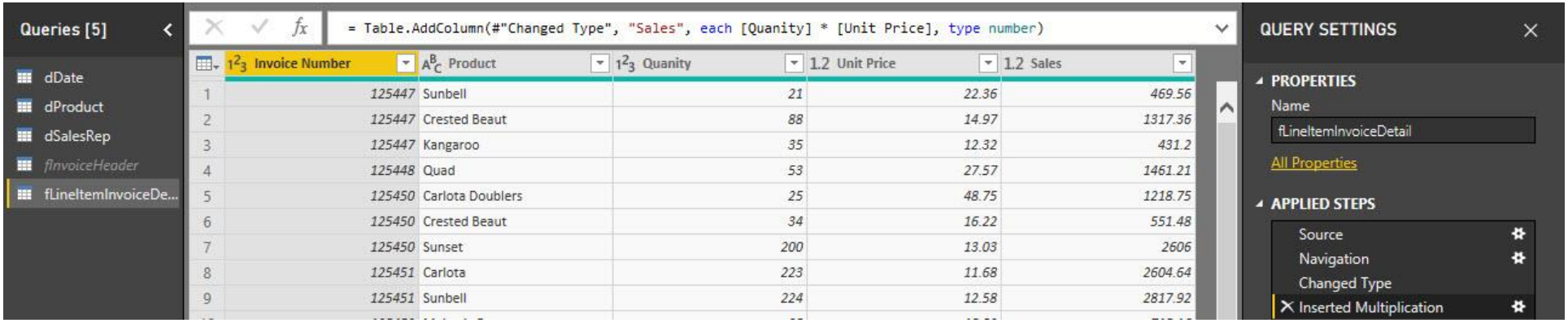


Product	Discount On Invoice	Shipping On Invoice
Aspen	$14,970.04	$5,478.60
Carlota	$15,346.03	$5,427.69
Carlota Doublers	$37,571.46	$7,378.59
Crested Beaut	$11,386.60	$6,268.43
Eagle	$8,166.87	$5,855.60
Kangaroo	$10,028.41	$4,723.41
Majestic Beaut	$14,905.66	$8,703.31
Quad	$22,657.89	$3,483.46
Sunbell	$14,213.91	$8,200.96
Sunset	$13,958.21	$7,347.25
Yanaki	$16,178.83	$6,910.81
Grand Total	**$179,383.93**	**$69,778.10**

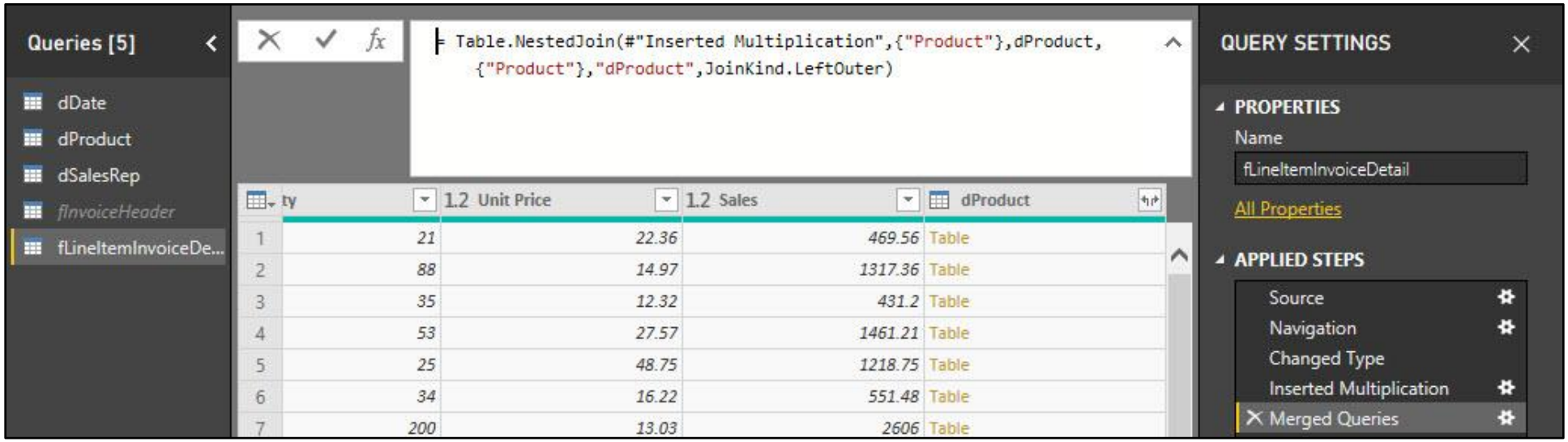
4) Power Query Solution in Power BI

1] Create a new Power BI Desktop file and import (Power BI File, Import, Excel Power Pivot option) the Excel Power Pivot Data Model from the file named "EMT1498-SourceModel.xlsx".

2] (45:40 in video) Power Query Formula to calculate "Sales" Column in the fLineItemInvoiceDetail Fact Table using Table.AddColumn function:

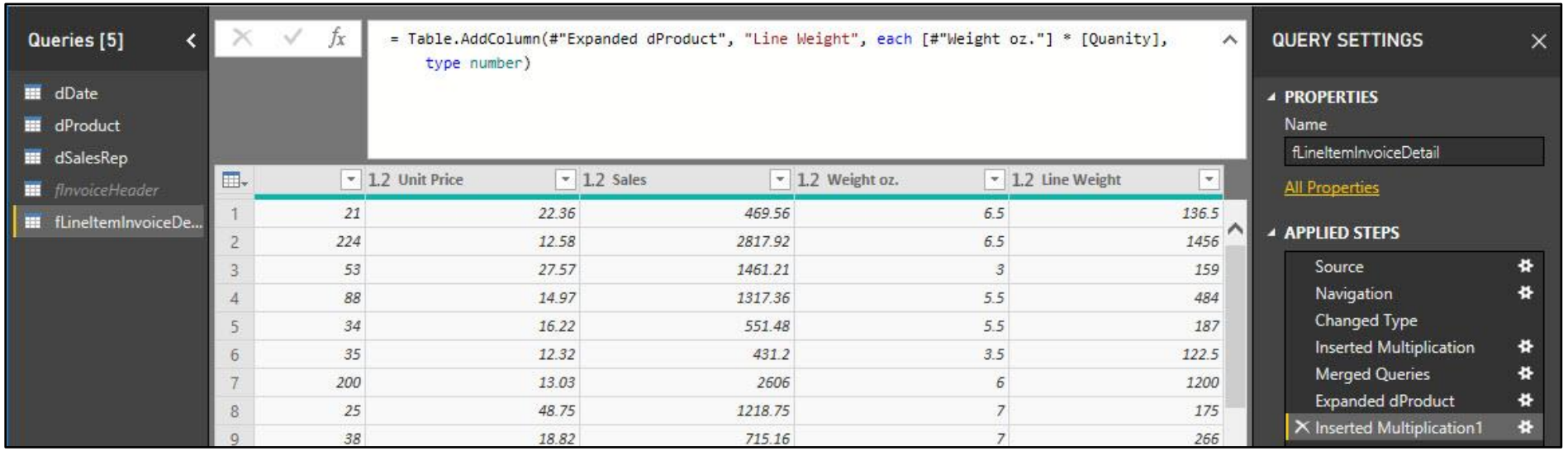


3] (46:53 in video) Power Query Merge – Top Table = Previous Step, Bottom Table = dProduct, Merge Column = Product, Join Kind = Left Outer:

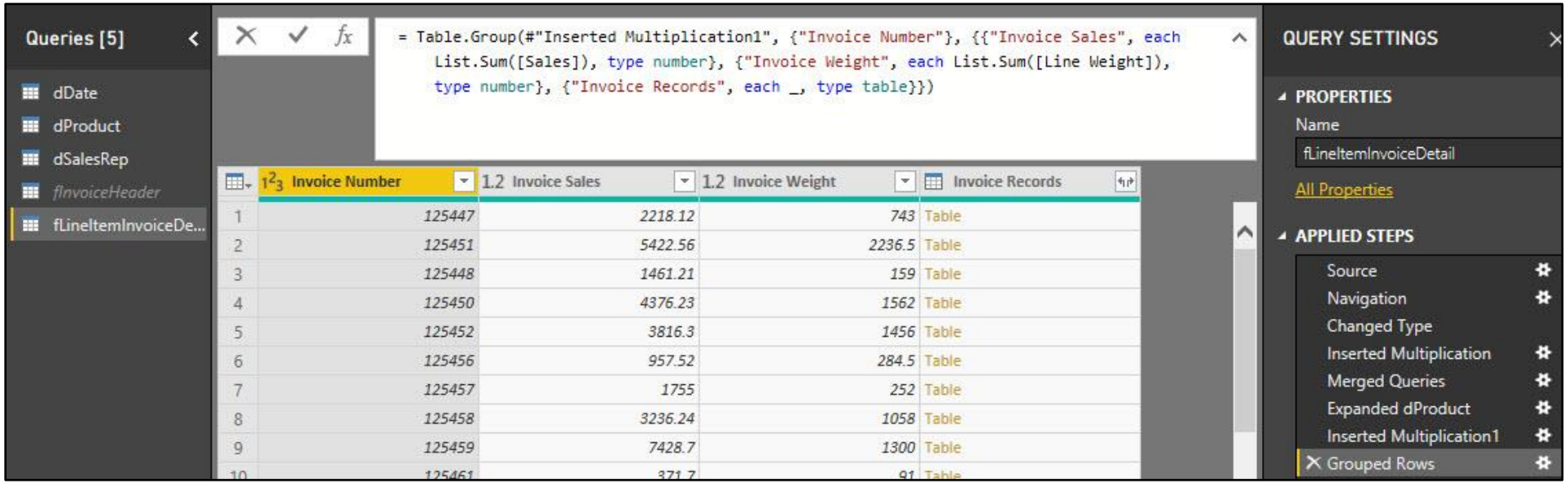


4] (47:00 in video) Expand the dProduct Column to get “Weight oz.” Column (no picture).

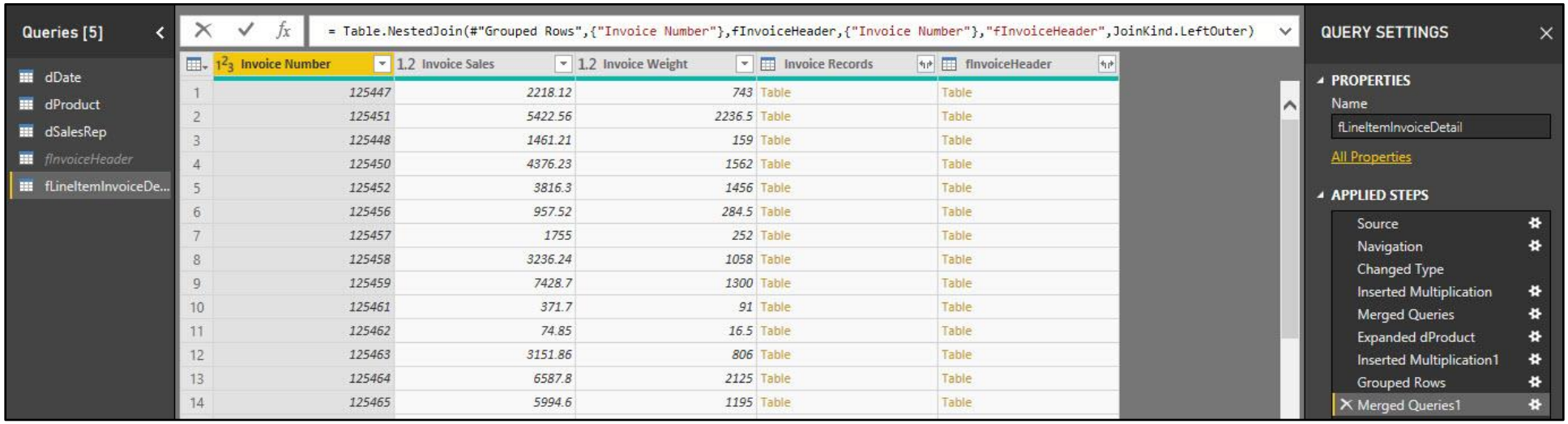
5] (47:26 in video) Power Query Formula to calculate “Line Weight” Column in the fLineItemInvoiceDetail Fact Table using Table.AddColumn function:



6] (47:42 in video) Power Query Group By feature to aggregate Invoice Sales, Invoice Shipping Weight and all rows in Invoice Line Grain Table for each Invoice Number (names of each group by column can be seen in below formula):

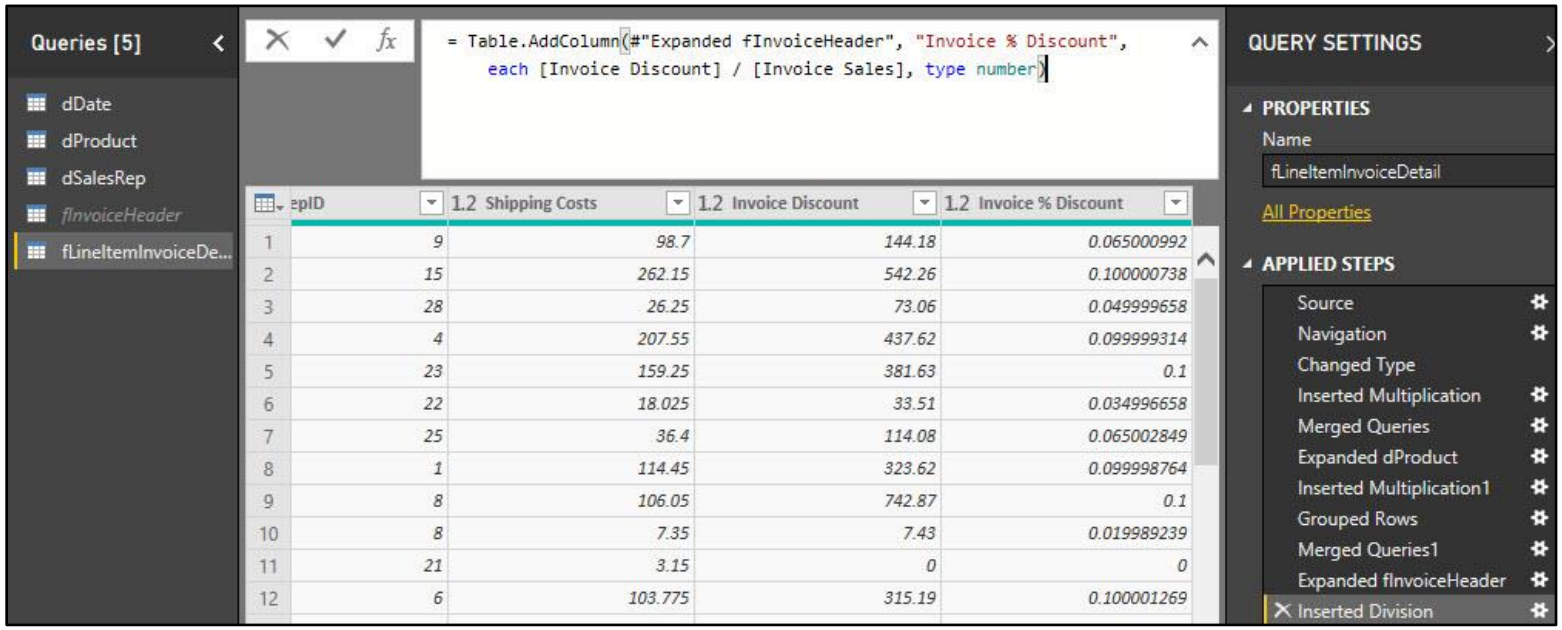


7] (49:52 in video) Power Query Merge – Top Table = Previous Step, Bottom Table = fInvoiceHeader, Merge Column = Invoice Number, Join Kind = Left Outer:



8] Expand the fInvoiceHeader Column to get the columns: Date, SalesRepID, Shipping Costs and Invoice Discount.

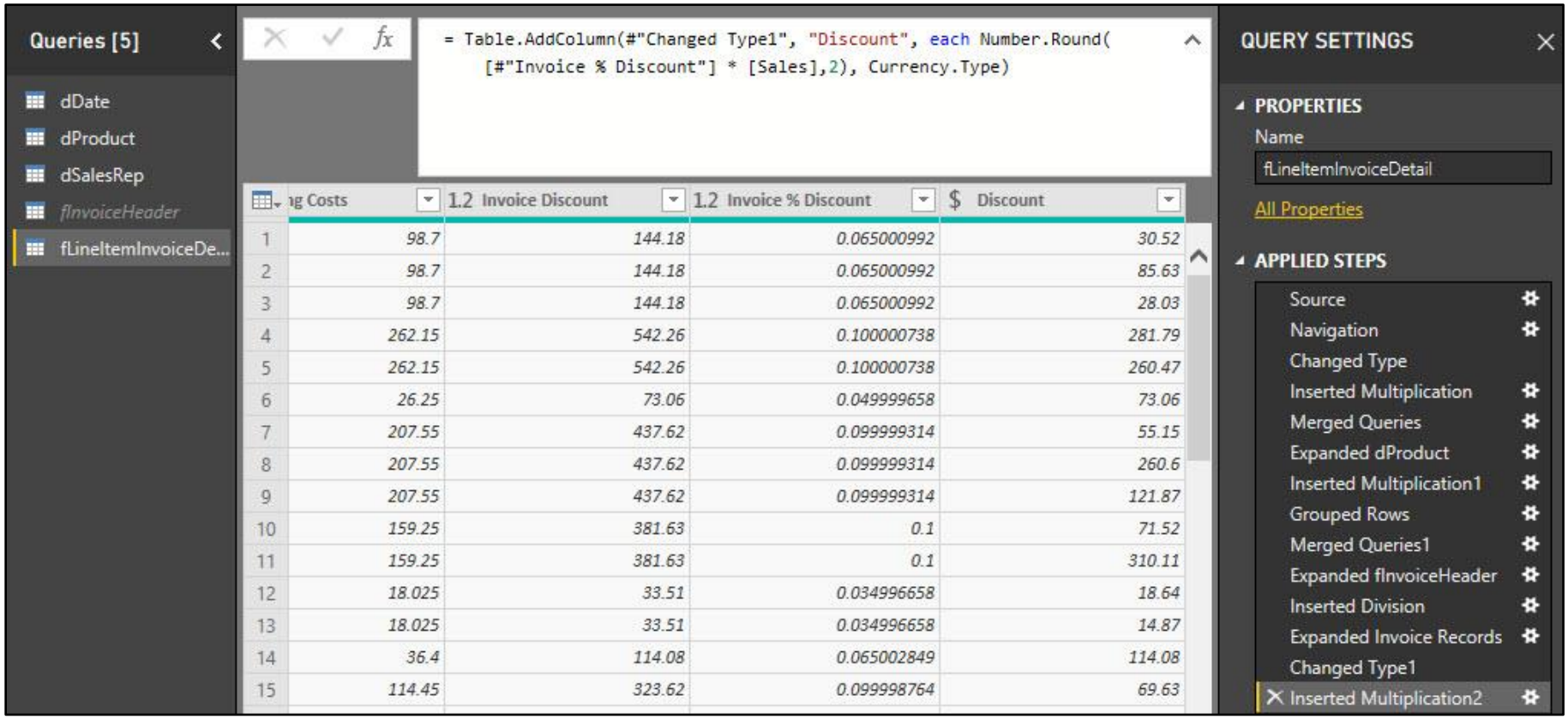
9] (50:52 in video) Power Query Formula for "Invoice % Discount" Column in the fLineItemInvoiceDetail Fact Table using Table.AddColumn function:



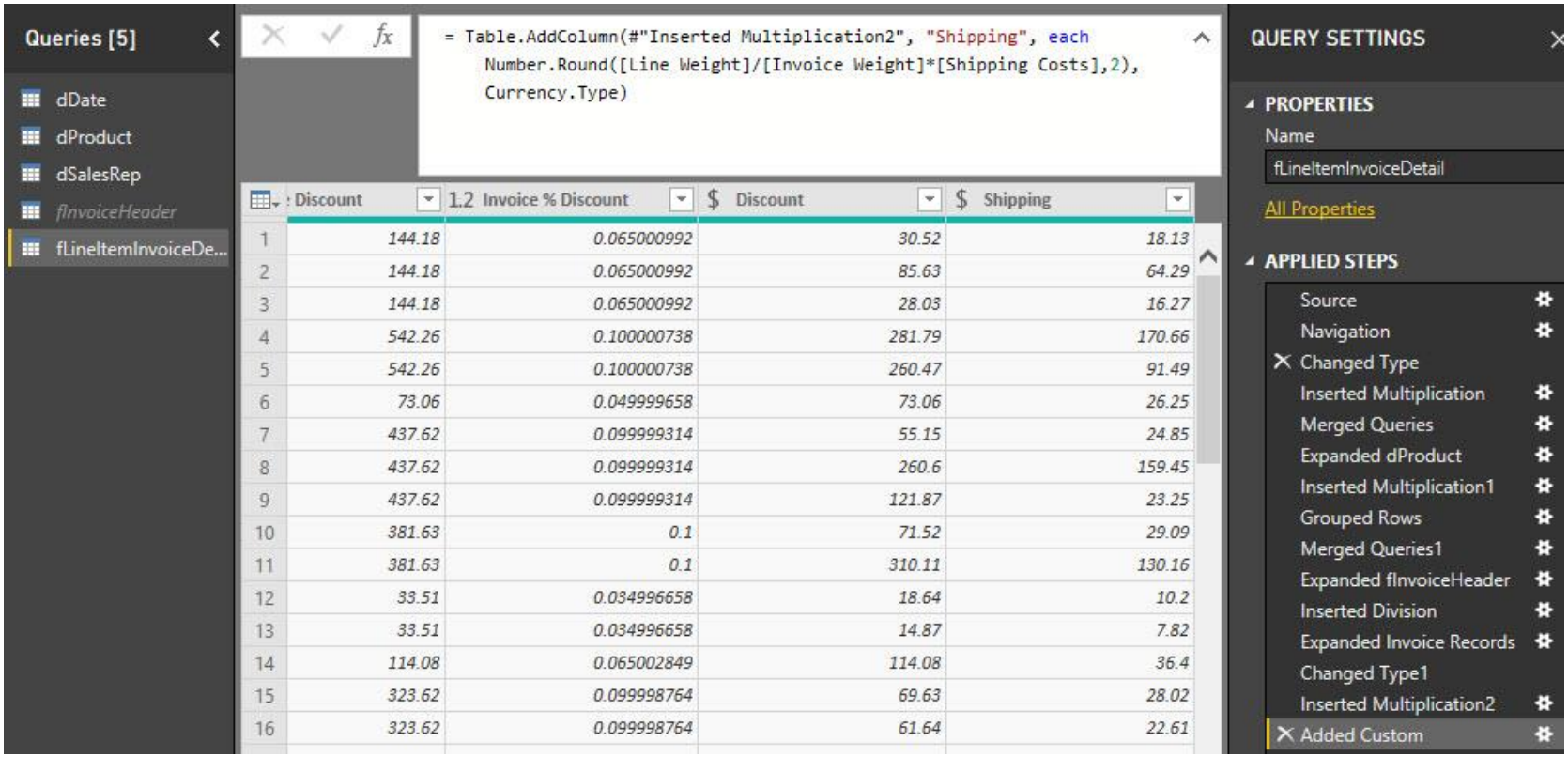
10] Expand the Invoice Record Column to get the columns: Product, Quatity, Sales and Line Weight (no picture).

11] Add correct Data Types to each column (no picture).

12] (54:16 in video) Power Query Formula for “Discount” Column in the fLineItemInvoiceDetail Fact Table using Table.AddColumn function and Number.Round:



13] (54:49 in video) Power Query Formula for “Shipping” Column in the fLineItemInvoiceDetail Fact Table using Custom Column with Table.AddColumn function and Number.Round:



14] (57:23 in video) Remove all column we do not need in final Fact Table (no picture).

15] (58:08 in video) Load Tables to Data Model, except Invoice Level Table (no picture).

16] (59:15 in video) In Data (Table) view, select the fLineItemInvoiceDetail Fact Table and create DAX Measures for Shipping, Discounts and Sales:

```
Total Shipping = SUM(fLineItemInvoiceDetail[Shipping])
```

```
Total Discount = SUM(fLineItemInvoiceDetail[Discount])
```

```
Total Sales = SUM(fLineItemInvoiceDetail[Sales])
```

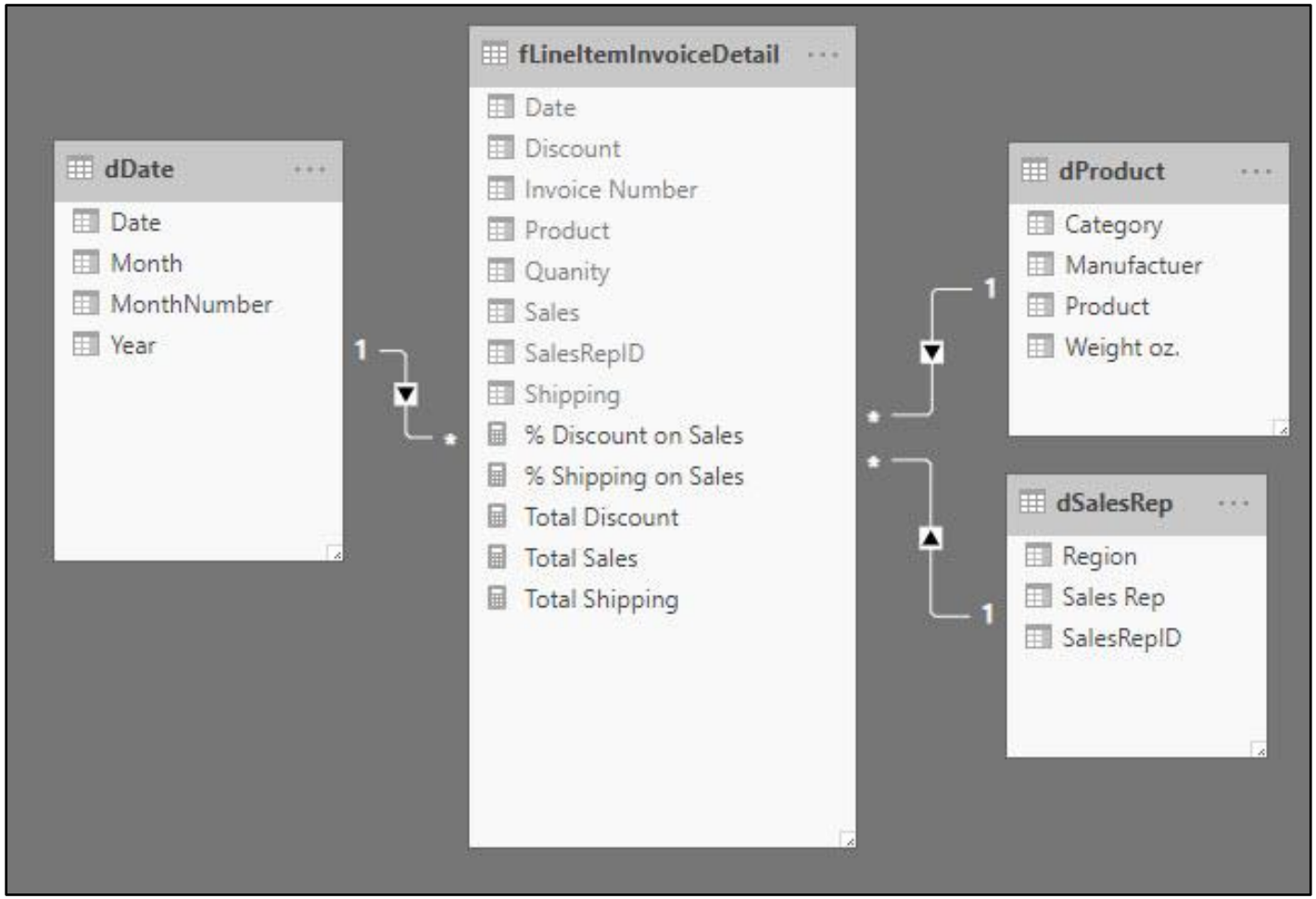
17] (01:00:10 in video) In Data (Table) view, select the fLineItemInvoiceDetail Fact Table and create % DAX Measures for Shipping and Discount as a percent of sales. Use the DIVIDE DAX Function, as seen here:

```
% Discount on Sales = DIVIDE([Total Discount],[Total Sales])
```

```
% Shipping on Sales = DIVIDE([Total Shipping],[Total Sales])
```

18] (01:01:15 in video) Hide Columns from Report View (no picture).

19] (01:01:33 in video) Look at Final Data Model, as seen here:



20] (01:01:47 in video) Create Visualization in Power BI Desktop

Product	Total Sales	Total Shipping	% Shipping on Sales	Total Discount	% Discount on Sales
Carlota	$6,123.31	$156.48	2.56%	$452.06	7.38%
Carlota Doublers	$20,520.00	$348.72	1.70%	$1,801.14	8.78%
Majestic Beaut	$13,844.04	$689.57	4.98%	$1,201.74	8.68%
Quad	$12,512.43	$148.94	1.19%	$989.98	7.91%
Sunbell	$5,218.51	$227.22	4.35%	$439.77	8.43%
Sunset	$10,011.96	$343.25	3.43%	$800.89	8.00%
Total	**$68,230.25**	**$1,914.18**	**2.81%**	**$5,685.58**	**8.33%**