

# Office 2016– Excel Basics 19

## Video/Class Project #31

### Excel Basics 19: SUMIFS, COUNTIFS, AVERAGEIFS, MINIFS, MAXIFS functions to make calculations with one or more conditions or criteria

**Goal in video # 19:** Learn about how to use **SUMIFS, COUNTIFS, AVERAGEIFS, MINIFS, MAXIFS** functions to make calculations with one or more conditions or criteria.

Topics Covered in Video:

We have already seen four Videos in this class that show how to use the SUMIFS function to add with a condition and & COUNTIFS function to count with a condition:

#### 1) Excel Basics 3: Count & Add with COUNT, COUNTA, SUM, COUNTIFS, SUMIFS Functions (Intro Excel #3)

	A	B	C	D	E	F	G
1	Date	SalesRep	Sales		Goal: Count How Many Sales Gigi Made		
2	10/23/2017	Chin	\$100		Criteria	Count	
3	10/23/2017	Gigi	\$200		Gigi	4	=COUNTIFS(B2:B10,E3)
4	10/24/2017	Dawn	\$100				COUNTIFS counts with one condition
5	10/24/2017	Chin	\$300				
6	10/24/2017	Chin	\$700		Goal: Add the Sales for Gigi		
7	10/23/2017	Dawn	\$100		Criteria	Sum	
8	10/24/2017	Gigi	\$200		Gigi	\$1,100	=SUMIFS(C2:C10,B2:B10,E8)
9	10/24/2017	Gigi	\$500				SUMIFS adds with one condition
10	10/23/2017	Gigi	\$200				

#### COUNTIFS(criteria\_range1, criteria1)

- Counts just some of the items in a range of cells based on a condition of set of criteria. Can count with 1 or more conditions/criteria.
- criteria\_range1** argument will contain the range with all the items to possible count.
- criteria1** argument contains the condition or criteria that tells the function what to count. Conditions and criteria could be things like:
  - Text (like "Gigi").
  - Dates or Numbers like: 10/23/2017

#### SUMIFS(sum\_range, criteria\_range1, criteria1)

- Add just some of the numbers in a range based on a condition of set of criteria. Can add with 1 or more conditions/criteria.
- sum\_range** argument will contain the range with the numbers.
- criteria\_range1** argument will contain the range with all the items to possible consider.
- criteria1** argument contains the condition or criteria that tells the function what to consider. Conditions and criteria could be things like:
  - Text (like "Gigi").
  - Dates or Numbers like: 10/23/2017

## 2) Excel Basics 4: PivotTables & SUMIFS Function to Create Summary Reports (Intro Excel #4)

	A	B	C	D	E	F	G	H	I
1	Date	Region	SalesRep	Sales		Goal: Creating a Sales Report where we added sales with one condition,			
2	10/20/17	West	Gigi	\$620		and if we change a number we want it to update instantly			
3	10/20/17	Northwest	Gigi	\$484		Region	Total Sales		
4	10/20/17	West	Freddy	\$376		Northwest	\$1,486	=SUMIFS(\$D\$15:\$D\$37,\$B\$15:\$B\$37,F4)	
5	10/20/17	Northwest	Freddy	\$1,141		Southwest	\$1,423	SUMIFS adds with one condition	
6	10/20/17	Northwest	Chin	\$725		West	\$2,705		
22	10/25/17	Northwest	June	\$546					
23	10/25/17	Northwest	Chin	\$162		PivotTables are usually easier to create than SUMIFS,			
24						but require a "Refresh" when source data changes			
25									
26						Region	Sum of Sales		
27						Northwest	\$4,791		
28						Southwest	\$3,117		
29						West	\$6,215		
30						Grand Total	\$14,123		

## 3) Excel Basics 12: Complete Formula Lesson of Formula Types & Formula Elements 12 Examples

	A	B	C	D	E	F	G
1	Product	Sales		<b>Goal: Count how many of each product we sold</b>			
2	Quad	\$43.00		<b>Product</b>	<b>Count</b>		
3	Sunset	\$23.00		Aspen	1	=COUNTIFS(\$A\$2:\$A\$7,D3)	
4	Sunset	\$23.00		Quad	3	COUNTIFS counts with one condition	
5	Quad	\$43.00		Sunset	2		
6	Aspen	\$19.95					
7	Quad	\$43.00					

## 4) Excel Basics 18: Defined Names in Excel Formulas & Functions & For Jump Go To!

	A	B	C	D	E	F	G	H	I	J	K
1	Transaction #	Date	Sales	SalesRep		<b>Goal: Create SalesRep Sales Report with SUMIFS Function and Defined Names</b>					
2	12568	12/1/2014	\$19,161	Jo		<b>SalesRep</b>	<b>Sales</b>				
3	12569	12/1/2014	\$15,027	Gigi		Jo	\$52,103.00	=SUMIFS(Sales,SalesRep,F3)			
4	12570	12/2/2014	\$12,953	Chin		Gigi	\$44,124.00	SUMIFS adds with one condition			
5	12571	12/2/2014	\$12,670	Jo		Chin	\$34,843.00				
6	12572	12/2/2014	\$8,893	Gigi							
7	12573	12/3/2014	\$4,667	Chin							
8	12574	12/3/2014	\$20,272	Jo							
9	12575	12/3/2014	\$20,204	Gigi							
10	12576	12/3/2014	\$17,223	Chin							

## 5) Now we want to see how to make calculations with one or more conditions / criteria using these functions:

- SUMIFS: Adds numbers with one or more conditions or criteria
- COUNTIFS: Counts with one or more conditions or criteria
- AVERAGEIFS: Averages numbers with one or more conditions or criteria
- MAXIFS: Finds Maximum number with one or more conditions or criteria
- MINIFS: Finds Minimum number with one or more conditions or criteria

6) Example 1:

- i. Using COUNTIFS Function to count how many Business classes you had with a grad of 3.0 or higher

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Quarter	Year	Department	Class #	Credits	Grade	Goal: Count How Many Business Classes You Had With a Grade of 3.0 or Higher							
2	Fall	2015	MATH	97	5	3.2	Criteria:							
3	Winter	2016	BUSN	210	5	4	Department	Grade						
4	Winter	2016	ECON	201	5	2.2	BUSN	>=3						
5	Winter	2016	BUSN	101	5	1.8	Count	8	=COUNTIFS(C2:C24,H4,F2:F24,I4)					
6	Spring	2016	MATH	148	5	2	COUNTIFS counts with two conditions/criteria							
7	Spring	2016	ECON	202	5	2								
8	Spring	2016	BUSN	133	3	3.4								
9	Sum	2016	BUSN	102	5	1.8								
10	Sum	2016	BUSN	135	5	3								
11	Fall	2016	BUSN	216	5	3.6								
12	Fall	2016	BUSN	205	5	2.4								
13	Fall	2016	BUSN	268	5	3.6								
14	Winter	2017	COMM	101	5	3.1								
15	Winter	2017	ENGL	101	5	2.6								
16	Winter	2017	BUSN	218	5	3.1								
17	Spring	2017	BUSN	190	5	2.7								
18	Spring	2017	COMM	205	5	3.3								
19	Spring	2017	BI	348	5	3.9								
20	Sum	2017	Accgt	121	5	3.8								
21	Sum	2017	BUSN	270	5	3.1								
22	Fall	2017	ENGL	205	5	3.7								
23	Fall	2017	BUSN	138	5	2.2								
24	Fall	2017	BUSN	160	5	3.2								

Department Field = "BUSN"  
AND  
Grade Field has number >= 3

8 Records contain  
"BUSN" AND >=8

- ii. In this example COUNTIFS has to count the records that contain the Department "BUSN" AND has a grade that is equal to or bigger than 3.0. This means that for each record in the Proper Data Set, there has to be the text "BUSN" in the Department Field AND a number greater than or equal to 3 in the Grade Field.

7) Comparative Operators

=	<b>Equal:</b> are two things equal?
<>	<b>Not:</b> are two things not equal? Type less than symbol, then greater than symbol.
>	<b>Greater than:</b> is the thing on the left greater than the thing on the right?
>=	<b>Greater than or equal to:</b> is thing on the left greater than or equal to thing on the right?
<	<b>Less than:</b> is the thing on the left less than the thing on the right?
<=	<b>Less than or equal to:</b> is the thing on the left less than or equal to the thing on the right?

Comparative Operator:	=	>	>=	<	<=	<>
Possible Words:	equal	greater than	greater than or equal to	less than	less than or equal to	not
		more than	at least	below	at most	complement of
		above	no less than	under	no more than	
			X or more		X or less	
Examples of Words:	equals 2000	greater than 2000	greater than or equal to 2000	less than 2000	less than or equal to 2000	not 2000
		more than 2000	at least 2000	below 2000	at most 2000	complement of 2000
		above 2000	no less than 2000	under 2000	no more than 2000	
			2000 or more		2000 or less	
<div>If Hurdle:</div> <div>2000</div>						

## 8) Logical Tests

- i. A Logical Test is a test that evaluates to TRUE or FALSE.
- ii. Logical Tests have only two possible answers: TRUE or FALSE.
- iii. Examples of Single Logical Tests:
  1. "Busn" = "Busn" this evaluates to TRUE
  2. "ECON" = "Busn" this evaluates to FALSE
  3. 3.2>=3 this evaluates to TRUE
  4. 2.7>=3 this evaluates to FALSE
  5. 12=12, this evaluates to TRUE
  6. 11=12, this evaluates to FALSE
  7. "Dog"="Dog" , this evaluates to TRUE
  8. "Cat"="Dog" , this evaluates to FALSE
  9. 500>=500, this evaluates to TRUE
  10. 499.99>=500, this evaluates to FALSE
- iv. Excel and Access are not case sensitive
  1. "BUSN" = "Busn"

## 9) AND Logical Test

- The Goal of an AND Logical Test is to run two or more logical tests and see if ALL logical tests evaluate to TRUE.
- Think of: "If you take out the garbage AND clean the table, you get desert". Only if you get two TRUES (took out garbage AND cleaned the table) do you get desert.
- For an AND Logical Test with two tests we can get these possible answers:
  1. FALSE, FALSE
  2. TRUE, FALSE
  3. FALSE, TRUE
  4. **TRUE, TRUE.**
- Only #4 example (TRUE, TRUE) will yield a TRUE from the AND Logical Test.
- For an AND Logical Test to evaluate to TRUE, you must get "All Are TRUE".
- Functions that can perform AND Logical Tests:
  1. SUMIFS: Adds numbers with one or more conditions or criteria
  2. COUNTIFS: Counts with one or more conditions or criteria
  3. AVERAGEIFS: Averages numbers with one or more conditions or criteria
  4. MAXIFS: Finds Maximum number with one or more conditions or criteria
  5. MINIFS: Finds Minimum number with one or more conditions or criteria
- If we enter more than one criteria\_range argument and more than one criteria argument into SUMIFS, COUNTIFS, AVERAGEIFS, MAXIFS, or MINIFS we are performing an AND Logical Test with AND Criteria.



- Picture of an AND Logical Test:

**AND Logical Test** Means We Have Two or More Logical Tests and All Tests Must Come Out TRUE  
Think of: "If you take out the garbage AND clean the table, you get desert".  
Only if you get two TRUES (took out garbage AND cleaned the table) do you get desert.

**Goal: Count How Many BUSN Classes You Had With a Grade of 3 or Higher**

**The AND Logical Test is:**  
the Department Field must contain BUSN  
AND  
the Grade Hurdle Field must contain a number that is >=3.

**Criteria:**

Department	Grade Hurdle
BUSN	>=3

**In Order to Count The Record, you Must Get Two TRUES!!!!**

Quarter	Year	Department	Class #	Credits	Grade
Winter	2016	ECON	201	5	2.2
Sum	2016	BUSN	102	5	1.8
Winter	2017	COMM	101	5	3.1
Winter	2016	BUSN	210	5	4

**AND Logical Test must get Two TRUES:**

Quarter	Year	Department	Class #	Credits	Grade
		FALSE			FALSE
		TRUE			FALSE
		FALSE			TRUE
		TRUE			TRUE

10) Compare SUMIFS and similar Functions and PivotTables for making Calculations with Conditions or Criteria.

- Advantage of PivotTable:
  1. Quick and easy to make.
  2. Conditions or Criteria in Rows or Columns area are created automatically by dragging a field to Rows or Columns area. When you drag a field to the Rows or Columns area a unique list of items from the field is created.
- Disadvantage of PivotTable:
  1. If source data changes, you must right-click PivotTable and point to Refresh.
  2. Sometimes the Conditions or Criteria you want to use in your calculation is hard to create using a PivotTable. For example, if you use a comparative operator with your Conditions or Criteria, it may be hard to create the calculation using a PivotTable.
- Advantage of SUMIFS:
  1. If source data changes, formulas update instantly.
  2. If you have Conditions or Criteria that use Comparative Operators, it is often easier to use SUMIFS and other similar Functions than it is to use a PivotTable.
- Disadvantage of SUMIFS:
  1. Have to type out conditions/criteria for Rows or Columns area.
  2. When making Calculations with Conditions or Criteria, it often takes longer to create a formula solution than it does to create a PivotTable solution.

Following are the 10 examples as seen in the video:

1) Example 1

	A	B	C	D	E	F	G	H	I	J	K	L	M	N						
1	Quarter	Year	Department	Class #	Credits	Grade	Goal: Count How Many BUSN Classes You Had With a Grade of 3 or Higher													
2	Fall	2015	MATH	97	5	3.2	and have ability to change criteria and have formulas instantly update													
3	Winter	2016	BUSN	210	5	4														
4	Winter	2016	ECON	201	5	2.2	<div>The AND Logical Test is: the Department Field must contain BUSN AND the Grade Field must contain a number that is &gt;=3.</div>													
5	Winter	2016	BUSN	101	5	1.8														
6	Spring	2016	MATH	148	5	2														
7	Spring	2016	ECON	202	5	2														
8	Spring	2016	BUSN	133	3	3.4														
9	Sum	2016	BUSN	102	5	1.8	Criteria:													
10	Sum	2016	BUSN	135	5	3	<table><tr><td>Department</td><td>Grade Hurdle</td></tr><tr><td>BUSN</td><td>&gt;=3</td></tr><tr><td>Count</td><td>8</td></tr></table>								Department	Grade Hurdle	BUSN	>=3	Count	8
Department	Grade Hurdle																			
BUSN	>=3																			
Count	8																			
11	Fall	2016	BUSN	216	5	3.6														
12	Fall	2016	BUSN	205	5	2.4	=COUNTIFS(C2:C24,H11,F2:F24,I11)													
13	Fall	2016	BUSN	268	5	3.6	COUNTIFS counts with two conditions/criteria													
14	Winter	2017	COMM	101	5	3.1														
15	Winter	2017	ENGL	101	5	2.6	** This is an example of where using COUNTIFS would be easier than trying to use a PivotTable													
16	Winter	2017	BUSN	218	5	3.1	because our condition uses a comparative operator (we have a hurdle as a condition).													
17	Spring	2017	BUSN	190	5	2.7														
18	Spring	2017	COMM	205	5	3.3														
19	Spring	2017	BI	348	5	3.9														
20	Sum	2017	Accgt	121	5	3.8														
21	Sum	2017	BUSN	270	5	3.1														
22	Fall	2017	ENGL	205	5	3.7														
23	Fall	2017	BUSN	138	5	2.2														
24	Fall	2017	BUSN	160	5	3.2														

2) Example 2

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Quarter	Year	Department	Class #	Credits	Grade		<b>Goal: Add Total Credits for BUSN Classes in the Year 2017.</b>					
2	Fall	2015	MATH	97	5	3.2		and have ability to change criteria and have formulas instantly update					
3	Winter	2016	BUSN	210	5	4							
4	Winter	2016	ECON	201	5	2.2		<b>The AND Logical Test is:</b> the Department Field must contain BUSN AND the Year Field must contain 2017.					
5	Winter	2016	BUSN	101	5	1.8							
6	Spring	2016	MATH	148	5	2							
7	Spring	2016	ECON	202	5	2							
8	Spring	2016	BUSN	133	3	3.4							
9	Sum	2016	BUSN	102	5	1.8		Criteria:					
10	Sum	2016	BUSN	135	5	3		Department	Year				
11	Fall	2016	BUSN	216	5	3.6		BUSN	2017				
12	Fall	2016	BUSN	205	5	2.4		Total Credits	25	=SUMIFS(E2:E24,C2:C24,H11,B2:B24,I11)			
13	Fall	2016	BUSN	268	5	3.6				SUMIFS adds numbers with two conditions/criteria			
14	Winter	2017	COMM	101	5	3.1							
15	Winter	2017	ENGL	101	5	2.6							
16	Winter	2017	BUSN	218	5	3.1							
17	Spring	2017	BUSN	190	5	2.7							
18	Spring	2017	COMM	205	5	3.3							
19	Spring	2017	BI	348	5	3.9							
20	Sum	2017	Accgt	121	5	3.8							
21	Sum	2017	BUSN	270	5	3.1							
22	Fall	2017	ENGL	205	5	3.7							
23	Fall	2017	BUSN	138	5	2.2							
24	Fall	2017	BUSN	160	5	3.2							



### 3) Example 3

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Quarter	Year	Department	Class #	Credits	Grade	Goal: Average Grades for BUSN Classes in the Year 2017.							
2	Fall	2015	MATH	97	5	3.2	and have ability to change criteria and have formulas instantly update							
3	Winter	2016	BUSN	210	5	4								
4	Winter	2016	ECON	201	5	2.2	<div>The AND Logical Test is: the Department Field must contain BUSN AND the Year Field must contain 2017.</div>							
5	Winter	2016	BUSN	101	5	1.8								
6	Spring	2016	MATH	148	5	2								
7	Spring	2016	ECON	202	5	2								
8	Spring	2016	BUSN	133	3	3.4								
9	Sum	2016	BUSN	102	5	1.8	Criteria:							
10	Sum	2016	BUSN	135	5	3	Department	Year						
11	Fall	2016	BUSN	216	5	3.6	BUSN	2017						
12	Fall	2016	BUSN	205	5	2.4	Average	2.86	=AVERAGEIFS(F2:F24,C2:C24,H11,B2:B24,I11)					
13	Fall	2016	BUSN	268	5	3.6	AVERAGEIFS averages numbers with two conditions/criteria							
14	Winter	2017	COMM	101	5	3.1								
15	Winter	2017	ENGL	101	5	2.6								
16	Winter	2017	BUSN	218	5	3.1								
17	Spring	2017	BUSN	190	5	2.7								
18	Spring	2017	COMM	205	5	3.3								
19	Spring	2017	BI	348	5	3.9								
20	Sum	2017	Accgt	121	5	3.8								
21	Sum	2017	BUSN	270	5	3.1								
22	Fall	2017	ENGL	205	5	3.7								
23	Fall	2017	BUSN	138	5	2.2								
24	Fall	2017	BUSN	160	5	3.2								



#### 4) Example 4

	A	B	C	D	E	F	G	H	I	J	K	L
1	<b>Date</b>	<b>Year</b>	<b>Product</b>	<b>Sales</b>	<b>COGS</b>		<b>Goal: Add Total COGS for Quad Product in the Year 2017.</b>					
2	7/15/2018	2018	Quad	2453.52	1128.6		and have ability to change criteria and have formulas instantly update					
3	2/15/2016	2016	Sunset	2391.92	980.69							
4	11/15/2017	2017	Carlota	53.23	22.89		<b>The AND Logical Test is:</b> the Product Field must contain Quad AND the Year Field must contain 2017.					
5	8/31/2018	2018	Carlota	1558.76	888.49							
6	12/16/2018	2018	Sunset	917.72	568.99							
7	5/16/2018	2018	Sunset	1876.27	731.75							
8	12/27/2016	2016	Yanaki	1487.82	684.4							
9	9/18/2017	2017	Quad	2017.73	807.09		Criteria:					
10	6/4/2018	2018	Yanaki	1459.48	569.2		<b>Product</b>	<b>Year</b>				
11	5/9/2018	2018	Carlota	1020.18	591.7		Quad	2017				
12	7/6/2016	2016	Carlota	653.87	274.63		<b>Total COGS</b>	<b>\$35,310.97</b>	=SUMIFS(E2:E665,C2:C665,G11,B2:B665,H11)			
13	11/9/2017	2017	Yanaki	1044.37	616.18				SUMIFS adds numbers with two conditions/criteria			
14	9/7/2017	2017	Carlota	1900.47	988.24							

#### 5) Example 5

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Date	Year	Product	Sales	COGS	Goal: Add Total Sales for each Product in the Year 2017.							
2	7/15/2018	2018	Quad	2453.52	1128.6	and have ability to change criteria and have formulas instantly update							
3	2/15/2016	2016	Sunset	2391.92	980.69								
4	11/15/2017	2017	Carlota	53.23	22.89	<div>The AND Logical Test is: the Year Field must contain 2017 AND the Product Field must contain the given Product Name.</div>							
5	8/31/2018	2018	Carlota	1558.76	888.49								
6	12/16/2018	2018	Sunset	917.72	568.99								
7	5/16/2018	2018	Sunset	1876.27	731.75								
8	12/27/2016	2016	Yanaki	1487.82	684.4								
9	9/18/2017	2017	Quad	2017.73	807.09								
10	6/4/2018	2018	Yanaki	1459.48	569.2	Year	2017						
11	5/9/2018	2018	Carlota	1020.18	591.7								
12	7/6/2016	2016	Carlota	653.87	274.63								
13	11/9/2017	2017	Yanaki	1044.37	616.18	Product	Total Sales						
14	9/7/2017	2017	Carlota	1900.47	988.24	Quad	\$65,927.28	=SUMIFS(\$D\$2:\$D\$665,\$C\$2:\$C\$665,G14,\$B\$2:\$B\$665,\$H\$10)					
15	4/13/2017	2017	Carlota	1129.45	463.07	Sunset	\$60,253.48	SUMIFS adds numbers with two conditions/criteria					
16	6/20/2017	2017	Carlota	328.7	128.19	Yanaki	\$73,134.36						
17	5/26/2017	2017	Sunset	58	36.54	Carlota	\$87,576.50						
18	3/3/2018	2018	Sunset	1646.76	1037.5								
19	11/10/2017	2017	Carlota	1865.2	895.3	** This is an example of where a PivotTable might be easier,							
20	1/18/2017	2017	Quad	884.17	512.82	if you don't mind using "Refresh" if source data changes							

## 6) Example 6

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	** Each Record is a sale.													
2														
3	<b>Date</b>	<b>Year</b>	<b>Product</b>	<b>Sales</b>	<b>COGS</b>	<b>Goal: Count number of Sales &gt;2000 for each product in the year 2017</b>								
4	7/15/2018	2018	Quad	2453.52	1128.6	and have ability to change criteria and have formulas instantly update								
5	2/15/2016	2016	Sunset	2391.92	980.69	<b>The AND Logical Test is:</b> the Year Field must contain 2017 AND the Sales Field must contain a sale number >2000 AND the Product Field must contain the given Product Name.								
6	11/15/2017	2017	Carlota	53.23	22.89									
7	8/31/2018	2018	Carlota	1558.76	888.49									
8	12/16/2018	2018	Sunset	917.72	568.99									
9	5/16/2018	2018	Sunset	1876.27	731.75									
10	12/27/2016	2016	Yanaki	1487.82	684.4									
11	9/18/2017	2017	Quad	2017.73	807.09									
12	6/4/2018	2018	Yanaki	1459.48	569.2									
13	5/9/2018	2018	Carlota	1020.18	591.7									
14	7/6/2016	2016	Carlota	653.87	274.63	<b>Year</b>	2017							
15	11/9/2017	2017	Yanaki	1044.37	616.18	<b>Sales Hurdle</b>	>2000							
16	9/7/2017	2017	Carlota	1900.47	988.24									
17	4/13/2017	2017	Carlota	1129.45	463.07	<b>Product</b>	<b>Count</b>							
18	6/20/2017	2017	Carlota	328.7	128.19	Quad	11	=COUNTIFS(\$D\$4:\$D\$667,\$H\$15,\$B\$4:\$B\$667,\$H\$14,\$C\$4:\$C\$667,G18)						
19	5/26/2017	2017	Sunset	58	36.54	Sunset	12	COUNTIFS counts with three conditions/criteria						
20	3/3/2018	2018	Sunset	1646.76	1037.5	Yanaki	14							
21	11/10/2017	2017	Carlota	1865.2	895.3	Carlota	14							
22	1/18/2017	2017	Quad	884.17	512.82									
23	6/12/2017	2017	Quad	1891.74	908.04	** This is an example of where a PivotTable would be harder to create								
24	10/8/2017	2017	Sunset	561.61	219.03	because our condition uses a comparative operator (we have a hurdle as a condition).								

## 7) Example 7


	A	B	C	D	E	F	G	H	I	J	K	L	M
1	<b>Date</b>	<b>Product</b>	<b>Sales</b>	<b>COGS</b>		<b>Goal: Add Sales for each Product automatically with the SUMIFS function and the Excel Table feature.</b>							
2	11/13/2017	Quad	2453.52	1128.6									
3	11/13/2017	Sunset	2391.92	980.69		<b>Product</b>	<b>Total Sales</b>						
4	11/13/2017	Carlota	53.23	22.89		Quad	\$4,830.72	=SUMIFS(MySales[Sales],MySales[Product],F4)					
5	11/13/2017	Yanaki	1558.76	888.49		Sunset	\$5,288.37	SUMIFS adds numbers with a <b>single condition</b>					
6	11/14/2017	Quad	917.72	568.99		Yanaki	\$4,620.86						
7	11/14/2017	Sunset	1876.27	731.75		Carlota	\$2,194.92						
8	11/14/2017	Carlota	1487.82	684.4									
9	11/14/2017	Yanaki	2017.73	807.09		** This is an example of where formulas and Excel Table feature make updating report automatic!!							
10	11/15/2017	Quad	1459.48	569.2									
11	11/15/2017	Sunset	1020.18	591.7									
12	11/15/2017	Carlota	653.87	274.63									
13	11/15/2017	Yanaki	1044.37	616.18									



## 8) Example 8

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Post	Time to Assemble Product at Post (Seconds)		Goal: Count how many times a Post fell below required <10 second assembly time.												
2	1	9														
3	2	9.2		AND Logical Test: Post has to equal given post AND Seconds <10												
4	3	8.3														
5	4	8.3		Hurdle in Seconds:	<10											
6	5	8.8														
7	6	10		Post	Count											
8	7	10.7		1	38	=COUNTIFS(\$A\$2:\$A\$589,D8,\$B\$2:\$B\$589,\$E\$5)										
9	8	8		2	41	COUNTIFS counts with two conditions/criteria										
10	9	9.1		3	45											
11	10	10.7		4	40											
12	11	9.9		5	45											
13	12	8.5		6	42											
14	1	10		7	17											
15	2	8.6		8	48											
16	3	9.1		9	45											
17	4	8.3		10	42											
18	5	8.1		11	19											
19	6	10.4		12	39											
20	7	9.1														
21	8	8.4		** This is an example of where a PivotTable would be harder to create												
22	9	8.3		because our condition uses a comparative operator (we have a hurdle as a condition).												

Assembly Line With 12 Posts:



Assembly Line With 12 Posts:





## 9) Example 9 & 10

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1		**Time to Assemble Product at Post (Seconds)													
2															
3	Post	Seconds		Goal: Find Min Time for Each Post. And have formulas update automatically.											
4	1	9		MINIFS and MAXIFS are New Functions in Office 365 for Excel 2016 or later											
5	2	9.2													
6	3	8.3													
7	4	8.3													
8	5	8.8													
9	6	10													
10	7	10.7													
11	8	8													
12	9	9.1													
13	10	10.3													
14	11	9.9													
15	12	8.5													
16	1	10													
17	2	8.6													
18	3	9.1													
19	4	8.3													
20	5	8.1													
21	6	10.4													
22	7	8.4													
23	8	9.2													
24	9	10.5													
25	10	10.4													
26	11	11.2													
27	12	11.1													
28															
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Assembly Line With 12 Posts:

