

Exercise Part 1-3:

Open a new workbook and enter the data as shown below.

	A	B	C	D	E	F	G
1	Category	Item	Quantity	Unit	Price	Total Cost	Brand/Comments
2	Produce	Oranges		1 Bag	3.99		Halo
3	Dairy	Milk		1.5 Gal	2.99		
4	Meat	Beef		3 Lb	4.99		
5	Drinks	Coffee		2 Lb	6.99		Store Brand
6	Pasta	Noodles		5 Lb	1.59		
7	Soup	Dry mix		5 Pkt	1.09		
8	Bakery	Bread		3 Pkt	1.99		
9	Snacks	Cookies		3 Doz	2.89		
10	Supplies	Paper plates		2 Pkt	1.29		

Follow the steps below.

- 1) Insert two rows above row number 1.
- 2) Enter the word “Grocery List” in cell A1. Change the font style to **Trebuchet MS** and size 24.
- 3) Enter the word “DATE” in cell A2. Change the font style to **Trebuchet MS**.
- 4) In Cell F4, enter the formula to find the total cost for row 4. (Hint: Qty*Price =C4*E4).
- 5) Once the answer in cell F4, copy the formula to all rows below. (Hint: double-click on fill-handle)
- 6) Select cells E4:E12and format as “Currency”.
- 7) Select cells F4:F12 and format as “Accounting”.
- 8) Select cell A13 and Type in “Average Price”.
- 9) Select cell E13 and find out the average price of the price column E by using the =AVERAGE under the **Σ AutoSum** function drop down arrow.
- 10) Select cell A14 and type in “Grand Total Cost”.
- 11) Select cell F14and find out the Sum by using the **Σ AutoSum** function.
- 12) Change row heights of row 1 and 14 to “30” by using Format>Row Height in Home>Cells group.
- 13) Select cell A3:G3. Change the Fill color to dark brown. Change the Font color to white.
- 14) Select cell A3:G14 and use “*Linked Cell*” Style.
- 15) Finally, select columns C through E and change the column width to “8” by using Format>Column width in Home>Cells group.
- 16) Open the **Grocery List Practice.xlsx** workbook. Your spreadsheet should look like **GroceryFinal** worksheet.

[View Options - Freezing Panes:](#)

Excel has useful tools to view content from the different parts of your workbook at the same time. They are called **freeze panes** (where you can freeze your rows and columns) and **split your worksheet**. Let's use **WeekOne** worksheet in the same **Excel Part4 Functions.xlsx** workbook to practice.

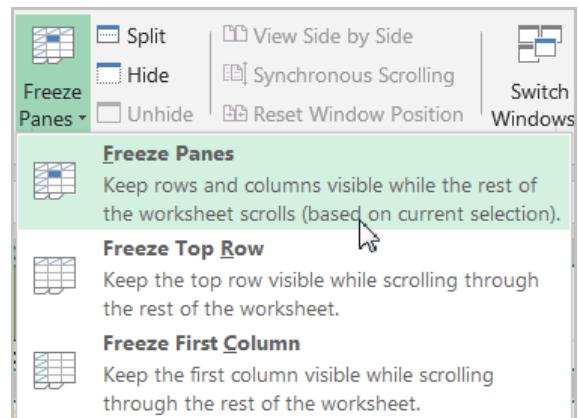
Freezing Rows And/Or Columns:

You may want to see certain rows or columns all the time in your worksheet, especially **header cells**. By freezing rows or columns in place, you'll be able to scroll through your content while continuing to view the frozen cells. Assume you want to see the first three rows with header and first column with category name on it appear at all times no matter how far we scroll to the right or down.

- Select the row below the row(s) and the right of the column you wish to freeze. In our example, we want to freeze **rows 1, 2 and 3**, and **column A** so we'll select **cell B4**.

	A	B	C	D	E	F	G	H
1	Grocery List							
2	DATE							
3	Category	Item	Quantity	Unit	Price	Total Cost	Brand/Comments	Counting Category
4	Produce	Oranges		1	Bag	\$3.99	\$3.99	Halo
5	Produce	Apples		2	Lb	\$1.99	\$3.98	

- Click the **View** tab on the **Ribbon**.
- Select the **Freeze Panes** command, then choose **Freeze Panes** from the drop-down menu. The rows will be frozen in place, as indicated by the gray line. You can scroll down the worksheet while continuing to view the frozen rows at the top and scroll to the right while being able to view the column A at all times.
- To unfreeze rows or columns, click the **Freeze Panes** command, then select **Unfreeze Panes** from the drop-down menu.
- The second choice **Freeze Top Row** on the drop-down list will only freeze the first row (row 1 only). Make the first row still visible on screen is when you apply this command and your active cell can be anywhere on your data sheet.
- The last choice **Freeze First Column** will only freeze the first column regardless of where your cell selection is when you apply this command. You must make sure that your 1st column is still visible on screen when you apply this command.



Other View Options

Open a New Window: Excel allows you to open **multiple windows** for a single workbook at the same time to compare and view the different sections of the workbook. In our example, we'll use this feature to compare two different worksheets **WeekOne** and **WeekTwo** from the same workbook. Follow instructions below.

- Click the **View** tab on the **Ribbon**, then select the **New Window** command. A new window for the the workbook will appear. Notice a number is assigned to the name of the workbook as

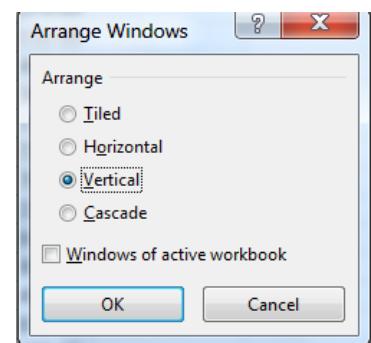
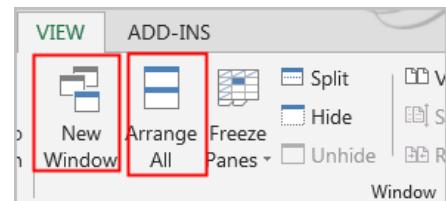
Excel Functions:1 - Excel

 and

Excel Functions:2 - Excel

in the **Title** area of the workbook.

- Regardless of which workbook number you are on, click on the **Arrange All** command. **Arrange Windows** dialog box will appear.
- Select **Vertical** to compare two different worksheets side by side in **Vertical** position. You can now compare different worksheets from the same workbook across windows. In our example, we'll select **WeekOne** worksheet in one window and **WeekTwo** in another to compare by using worksheet scrollbar on bottom left.



The screenshot displays two separate Excel windows side-by-side. Both windows have the title bar 'Excel Functions:1 - Excel' and 'Excel Functions:2 - Excel' respectively. Each window contains a worksheet named 'Grocery List'. The data in both worksheets is identical, showing a list of items with columns for Category, Item, Quantity, Unit, Price, and Total Cost. The windows are arranged vertically, demonstrating the 'Vertical' arrangement option mentioned in the text. The status bar at the bottom of each window shows the date and time as 3/9/2020 and 4:00 PM.

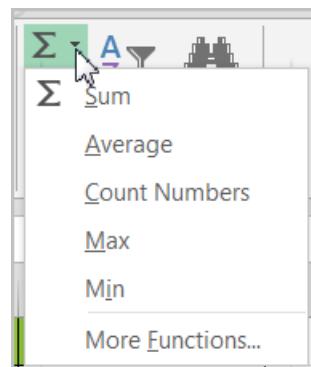
- When you are done comparing, close either one. The number assignment at the end of the Title will disappear. **Note:** you can use New Window command to simultaneously open as many worksheets you want to compare at the same time.

Introduction to Functions:

A **Function** is a predefined formula that performs calculations using specific values in a particular order. Excel includes many common functions under the **Home** tab that can be useful for quickly finding the **sum**, **average**, **count**, **maximum value**, and **minimum value** for a range of cells. Let's examine the different parts of a **sum function** and how to create arguments to calculate values and cell references.

= Sum (A10:A20)

Equation Function Argument



Equation: is required at beginning of every formula.

Function: is a predefined formula; in this example, to sum or add what is stated in the argument.

Argument: contains the information you want to calculate and it must be enclosed within a **parenthesis**. It can refer to both **individual cells** and **cell ranges**, in this example, referring to cell range A10 through A20. You can include one argument or multiple arguments, depending on the syntax required for the function.

Basic Mathematical Functions		
AVERAGE	Finds the average within a range of cells.	=AVERAGE(A10:A20)
COUNT	Finds the number of cells within a range of cells that contain values (numbers) in them.	=COUNT(A10:A20)
COUNTA	The COUNTA function counts cells containing any type of information , including error values and empty text (""). For example, if the range contains a formula that returns an empty string, the COUNTA function counts that value. The COUNTA function does not count empty cells .	=COUNTA(A3:A15)
COUNTBLANK	Counts empty cells in a specified range of cells.	=COUNTBLANK(B3:B15)
MAXIMUM	Finds the largest number within a range of cells.	=MAX(D3:D15)
MINIMUM	Finds the smallest number within a range of cells.	=MIN(D3:D15)
SUM	Finds the total or sum within a range of cells.	=SUM(A10:A20)
Basic Date Functions		
NOW()	Displays the computer's current date and time. The formula will update the date and time next time the workbook is opened.	=NOW()
TODAY()	Displays the computer's current date. The formula will update the date next time the workbook is opened.	=TODAY()

Creating Basic Functions:

Single Argument Exercise: Open **WeekOne** worksheet **Excel Part4 Functions.xlsx** to practice creating arguments. Make sure to freeze the pane by selecting cell **B4** so we can see header rows.

AVERAGE Function:

- In Cell **E33** we want to calculate the average price per unit. Select Cell **E33**.
- Click on the drop-down arrow next to the **Sum** function in the **Editing Group** under the **Home** tab. Select **Average**.
- The selected function will appear in the cell. If logically placed, the **Average** command will automatically select a cell range for the argument. In our example, cells **E4:E32** were selected automatically. In our case, there is no data in **E31 and E32**. You can manually fix the argument directly in the formula bar area by using the backspace button on your keyboard and change the cell address from **E32** to **E30**. (OR you can use your mouse; click and drag to include the desired cell range into the argument as well.)



The figure consists of three side-by-side screenshots. The left screenshot shows the Excel formula ribbon with the 'Sum' option under the 'Σ' icon highlighted. The middle screenshot shows a table with columns 'Unit' and 'Price'. The formula bar at the top contains the formula '=AVERAGE(E4:E32)'. The right screenshot shows the same table, but the formula bar now contains '=AVERAGE(E4:E30)', with the range 'E4:E30' highlighted by a red box.

- Press Enter on your keyboard. The function will be calculated, and the result will appear in the cell. In our example, the average of **E4:E30** is \$2.97.

COUNT Function:

- Select **Cell C32**.
- Since the *column includes numbers*, we will select the **Count** function from the list. We are using the **Count Function** here to count how many items are on the list. We are **NOT ADDING** the items.
- The formula appears =COUNT(C4:C31). Fix the formula to include up to C30 only.
- Hit **Enter**. The count should give you **27** meaning there are 27 items where there is a number in the Quantity column. **Note** the **Count Function** will count any number including **zero**. But it will not count either blank nor text.

Quantity
3
2
1
=COUNT(C4:C30)

You can find the similar answer on Column B, the Item *column with text* by using the **CountA Function**.

- Select **Cell B31**.
- Since the column includes texts, we are using **CountA function** to count how many items are on the list. The answer should be the same as 27 when you hit **Enter**.

Item
Cookies
Paper plates
Napkins
=counta(b4:b30)

COUNT BLANK Function:

- Select Cell **B31** again.
- Change the **CountA** function in that cell from **CountA** to **Countblank** in the formula bar area. Hit **Enter**. You will have the answer **zero** as there is no blank cell value yet in column B.
- Delete the content of the **Cell B30** by using the **Delete** button. Now it should say **1** in **Cell B31** as there is one blank cell in the range **B4:B30**.

SUM Function: Find out the sum of Total Cost column, **Column F**.

- Click on Cell **F34**.
- Select the **Sum** function from the list.
- Fix the cell range in the formula bar using the backspace to change F33 to F30 since there is no data F31:F33.
- Hit **Enter**. The sum of **Total Cost** in our example is: \$180.67.

=SUM(F4:F30)

MAXIMUM Function: Find out the most expensive item in column **E (Price Column)** in cell **E35** by using the =MAX(E4:E30). The result should be: \$6.99 for Coffee.

MININUM Function: Find out the least expensive item in column **E (Price Column)** in cell **E36** by using the =MIN(E4:E30). The result should be: \$.49 for Bananas.

Multiple Argument Example: A function can contain multiple arguments. Each argument has to be separated by the "comma". For example, in **Cell F37**, we want to find out total costs for all "Produce", "Pasta" and "Supplies" selectively. The function =SUM(F4:F8, F20:F21;F29:F30) will add the values of all the cells in the three arguments. The answer should be \$40.19.

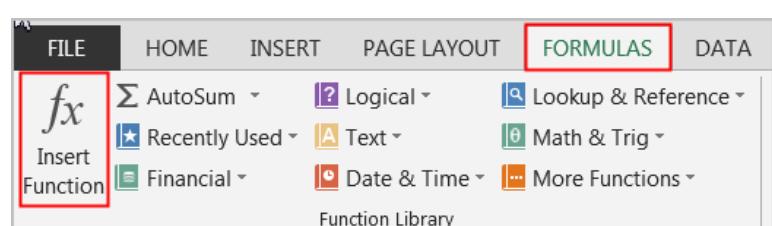
=sum(F4:F8,F20:F21,F29:F30)

Now Function: Displays the computer's current date and time. The formula will update the date and time next time the workbook is opened. Select Cell **C2** and type in =Now()

Today Function: Displays the computer's current date. The formula will update the date next time the workbook is opened. Select Cell **B2** and type in =Today()

Complex Function/Formula:

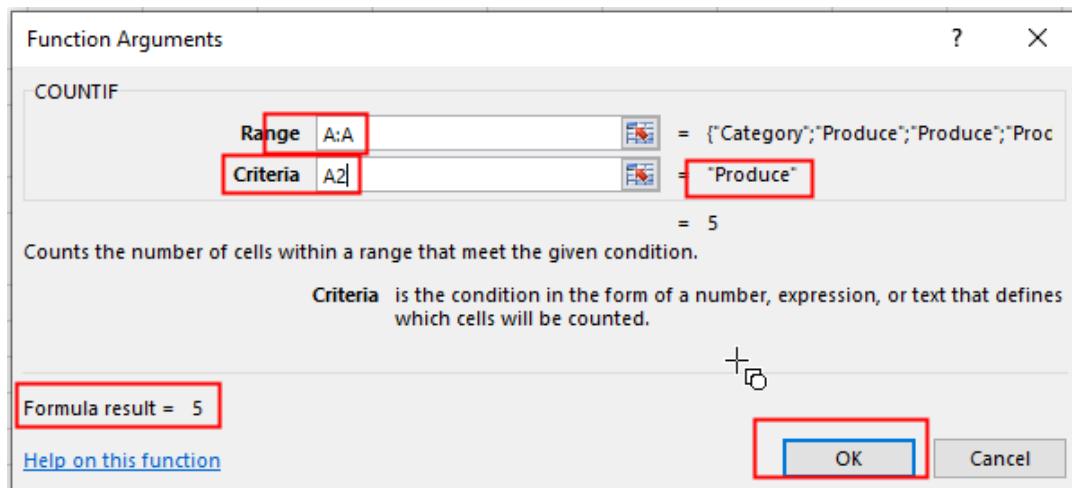
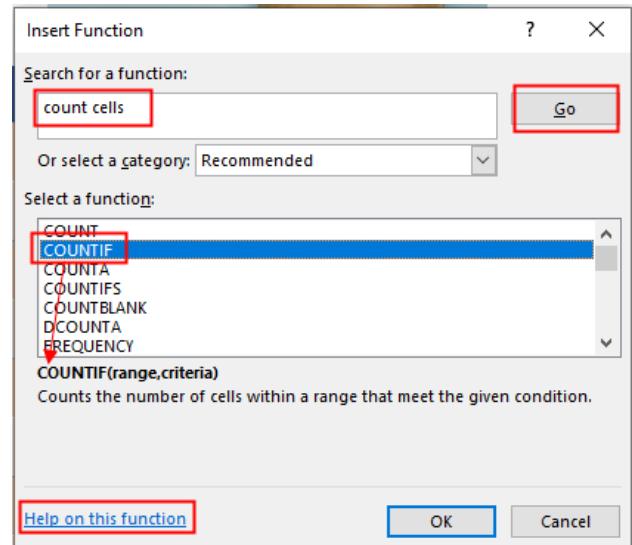
There are hundreds of functions in Excel and you can search them by category, such as Financial, Logical, Text, Date & Time, and more from the **Function Library** on the **Formulas** tab. The ones you use most frequently will depend on the type of data



your workbook contains. To access the **Function Library**, select the **Formulas** tab on the **Ribbon**. The **Function Library** will appear. Click on each category to explore some of the different types of functions that will be helpful as you create new projects.

For complex formulas, it's not easy to remember which function and which arguments to use for each task. Fortunately, the **Insert Function** feature in Excel helps you with this. In cell H4, we will use the same example above to count the number of cells to get the answer "how many **Produce** are ordered in column A". Since we do not know which functions to use, we can simply type in a natural question like "**count cells**" in the "**Search for a function:**" box and hit "**Go**" button. From suggested functions appeared in the "**Select a Function**" box, an explanation on "**COUNTIF**" function suits our need – *We want to count how many cells in Column A (range) includes the word "Produce" (criteria).* (If we want more explanation and see the examples, we can click on **Help on this Function** box and a new **Help** window will pop up with more detailed explanation and examples.) Follow the steps below.

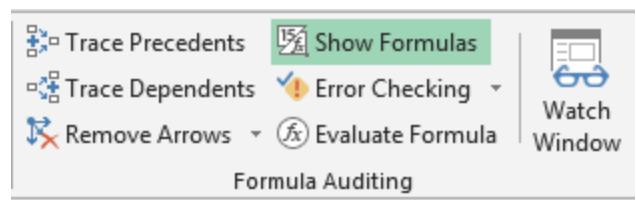
- Select **Cell H4**.
- Click on **Formulas>Insert Function**.
- Select **COUNTIF** from the suggested functions.
- Click on **OK** button.
- **Function Arguments** dialog box will come up. In the **Range** box, you want to count all cells in Column A. So, simply select the entire column A.
- In the **Criteria** box, you want to include all cells in column A with the word "Produce" in it. You can type in the word "Produce" yourself or simply select one of the cells that include "Produce" in it, in this example, point and click on cell A4. You can see the word "Produce" shows up on the right of the **Criteria** box and the result shows "5" already.
- Click on **OK** button.
- Click on **OK**. The result should be 5.



- Use the same function to count "Dairy" in cell H9; "Meat" in cell H13; "Drinks" in cell H16; "Pasta" in cell H20; "Soup" in cell H22; "Bakery" in cell H24; "snacks" in cell H25; and "Supplies" in H29.

Display Formulas on your worksheet:

You can display the formulas in your worksheet by using the **Show Formulas** command in the **Formula Auditing** group under the **Formulas** tab. All column widths will be noticeably widened to show values (if they are fixed value) and all formulas.



	C	D	E	F	G	H
1						
2						
3	Quantity	Unit	Price	Total Cost	Brand/Comments	Counting Category
4	1	Bag	3.99	=C4*E4	Halo	=COUNTIF(A:A,A4)
5	2	Lb	1.99	=C5*E5		
6	3	Lb	0.49	=C6*E6		
7	1	Bunch	1.29	=C7*E7		
8	2	Lb	0.99	=C8*E8		
9	1.5	Gal	2.99	=C9*E9		=COUNTIF(A:A,A9)
10	1	Lb	5.99	=C10*E10	Variety of block cheeses	

To get back to normal display, click on the **Show Formulas** one more time.

	A	B	C	D	E	F	G	H
1								
2								
3	Category	Item	Quantity	Unit	Price	Total Cost	Brand/Comments	Counting Category
4	Produce	Oranges	1	Bag	\$3.99	\$3.99	Halo	5
5	Produce	Apples	2	Lb	\$1.99	\$3.98		
6	Produce	Bananas	3	Lb	\$0.49	\$1.47		
7	Produce	Lettuce	1	Bunch	\$1.29	\$1.29		
8	Produce	Tomatoes	2	Lb	\$0.99	\$1.98		
9	Dairy	Milk	2	Gal	\$2.99	\$4.49		4

Appendix:

"Order of Operations" to more complex mathematical expressions:

A complex mathematical expression has more than one mathematical operator, such as $5+2*8$. When there is more than one operation in a formula, the order of operations tells **Excel** which operation to calculate first. In order to use **Excel** to calculate complex formulas, you will need to understand the order of operations as follows:

Excel calculates formulas based on the following order of operations:

1. Operations enclosed in **parentheses**
2. **Exponential** calculations (3^2 , for example)
3. **Multiplication** and **division**, whichever comes first
4. **Addition** and **subtraction**, whichever comes first

*A mnemonic that can help you remember the order is **PEMDAS**, or Please Excuse My Dear Aunt Sally.*

So in this following example to solve - $10+(6-3)/2^2*4-1$, the order of operations will be carried out according to the order stated above. See the steps below.

Step 1)

Using the Order of Operations	
Parentheses	$10+(6-3)/2^2*4-1$
E	
M	
D	
A	
S	

Step 2)

Using the Order of Operations	
P	$10+(6-3)/2^2*4-1$
Exponents	$10+3/2^2*4-1$
M	
D	
A	
S	

Step 3)

Using the Order of Operations	
P	$10+(6-3)/2^2*4-1$
E	$10+3/2^2*4-1$
Multiplication	$10+3/4*4-1$
Division	Whichever comes first!
A	
S	

Step 4)

Using the Order of Operations

P	$10 + (6-3)/2^2 \cdot 4 - 1$
E	$10 + 3/2^2 \cdot 4 - 1$
Multiplication	$10 + 3/4 \cdot 4 - 1$
Division	$10 + 0.75 \cdot 4 - 1$
A	
S	

Step 5)

Using the Order of Operations

P	$10 + (6-3)/2^2 \cdot 4 - 1$
E	$10 + 3/2^2 \cdot 4 - 1$
M	$10 + 3/4 \cdot 4 - 1$
D	$10 + 0.75 \cdot 4 - 1$
Addition	$10 + 3 - 1$
Subtraction	

Step 6)

Using the Order of Operations

P	$10 + (6-3)/2^2 \cdot 4 - 1$
E	$10 + 3/2^2 \cdot 4 - 1$
M	$10 + 3/4 \cdot 4 - 1$
D	$10 + 0.75 \cdot 4 - 1$
Addition	$10 + 3 - 1$
Subtraction	$13 - 1$

Step 7)

Using the Order of Operations

P	$10 + (6-3)/2^2 \cdot 4 - 1$
E	$10 + 3/2^2 \cdot 4 - 1$
M	$10 + 3/4 \cdot 4 - 1$
D	$10 + 0.75 \cdot 4 - 1$
A	$10 + 3 - 1$
S	$13 - 1 = 12$