

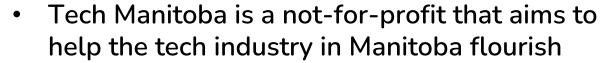
# Intro to Google Sheets

#### Day 2

We acknowledge that we are located on Treaty One Territory and in the heartland of the Métis Nation. We recognize the mistakes of the past and believe in reconciliation, cooperation and moving forward in partnership with Indigenous communities.



# What is Tech Manitoba Why is this free?



- TechMB's digital literacy program provides free computer courses
- Federal funding allows us to provide these courses for free: to help us continue to get funding, please complete the survey after the course



### Introduction



[Instructor Name]
[Intructor email]



### Students Introduction

- What is your name?
- Country of origin?
- Occupation?
- What do you expect to learn?



#### Housekeeping tasks

- Registration Forms Please fill out if not done already
- Media Release agreement Please read and sign if you are willing to be photographed
- End of Course Survey Will be done after completion of the course
- You MUST complete the survey at the end of the course to receive your certificate. Please complete this survey as it allows us to get funding from the government and continue delivering these free courses
- You will need to be signed into Google for this course



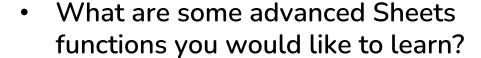
# Intro to Google Sheets 2



#### Learning Outcomes for this course

- Create simple and complex formulas
- Know the mathematical order of operations
- Learn how to use relative and absolute cell references
- Create functions
- Sort and filter data

### **TECHMB** Discussion







#### Creating simple formulas

Formulas can be used to automatically perform computations on cell values. All formulas begin with an equals sign (=). Sheets uses standard operators for

formulas:

Addition	+
Subtraction	1 - T
Multiplication	*
Division	
Exponents	۸

Most formulas will refer to other cells.

In this example, cell A1 is added to A2. Note how the formula automatically updates the value to 11 when the value in A1 is changed to 8.

10

11

3

3



#### Creating simple formulas

Here are some additional examples of simple formulas:

=A1+A2	Adds cells A1 and A2
=C4-3	Subtracts 3 from cell C4
=E7/J4	Divides cell E7 by J4
=N10*1.05	Multiplies cell N10 by 1.05
=R5^2	Finds the square of cell R5

1. Select the cell that will display the calculated value

	> 1 5 DE
JULY BUDGET	\$1,500
JUNE BUDGET	\$1,200

2. Type = and the cell address *or* click the cell(s) you want to reference

JUNE BUDGET	\$1,200
JULY BUDGET	\$1,500
TOTAL	=D10

4. Hit Enter. Done!

JUNE BUDGET	\$1,200
JULY BUDGET	\$1,500
TOTAL	\$2,700

3. Type the operator and then type or click the second cell to be referenced

\$1,200
\$1,500
=D10+D11

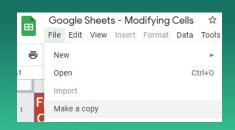


#### Practice!

- Open the **example file** and click File > Make a copy
- Select the **Challenge** sheet



- Use the fill handle or copy and paste to copy the formula to cells D5 and D6
- In cell D7, create a formula that adds cells D4, D5, and D6
- Change the quantity in cell B4 to 15. You should also see cells D4 and D7 change





### The spreadsheet should look something like this when you're done:





#### Creating complex formulas

Complex formulas have multiple operators. You will need to know the order of operations to use complex formulas

	Order of Operations PEMDAS
Р	Parenthesis, ()
Е	Exponents, a <sup>n</sup>
M	Multiplication or Division
D	(Left to right)
Α	Addition or Subtraction
S	(Left to Right)

- Anything in Parenthesis is calculated first
- 2. Next exponents are calculated
- 3. Then multiplication, then division
- 4. Then addition, then subtraction

Please Excuse My Dear Aunt Sally



#### Creating complex formulas: example

Cell D6 contains a formula that calculates sales tax by adding the prices together and multiplying by the 5.5% tax rate (0.055)

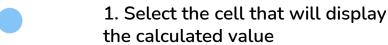
A	В	С	D
SABROSA Empanadas & More	Catering Invoice Sabrosa Empanadas & Mi 1202 Biscayne Bay Drive Orlando, FL 32804		Invoice #: 5690B
NU ITEM	UNIT PRICE	QUANTITY	LINE TOTAL
ales: Carnitas	\$2.29	20	
amales: Vegetable	\$2.29	30	\$68.70
Empanadas: Nutella & Banana	\$3.99	40	\$159.60
		TAX	=(D3+D4+D5)*0.055
		TOTAL	

- 1. First the values inside parentheses are added: (D3+D4+D5) = \$274.10
- 2. Then \$274.10 is multiplied by the tax rate: \$274.10\*0.055 = \$15.08

It's very important to follow the order of operations. If parentheses are not included, the multiplication is calculated first, and the result is incorrect

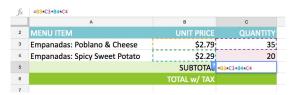


#### Creating complex formulas





2. Enter your formula. In this example, =B3\*C3+B4\*C4



This is the order of operations:

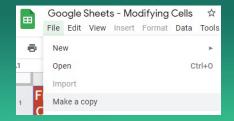
- 1. B3\*C3: 2.79 \* 35 = 97.65
- 2. B4\*C4: 2.29 \* 20 = 45.80
- 3. 97.65 + 45.80 = 143.45

3. Hit Enter. Done!

fx	=B3*C3+B4*C4		
	A	В	С
2	MENU ITEM	UNIT PRICE	QUANTITY
3	Empanadas: Poblano & Cheese	\$2.79	35
4	Empanadas: Spicy Sweet Potato	\$2.29	20
5		SUBTOTAL	\$143.45
6		TOTAL w/ TAX	
7			



#### Practice!



- Open the <u>example file</u> and click File > Make a copy
- Select the Challenge sheet. We will use complex formulas to apply some discounts
- In cell **D6**, create a formula that calculates the total using the 20% off discount (hint: 80% of the total will remain)
- In cell D7, create a formula that calculates the total using the \$30 off discount



# The spreadsheet should look something like this when you're done:

	A	В	С	D
1	SABROSA Empanadas & More	Catering Invoice Sabrosa Empanadas & M 1202 Biscayne Bay Drive Orlando, FL 32804		Invoice #: 5690B
2	MENU ITEM	UNIT PRICE	QUANTITY	LINE TOTAL
3	Tamales: Carnitas	\$2.29	20	\$45.80
4	Tamales: Vegetable	\$2.29	30	\$68.70
5	Empanadas: Nutella & Banana	\$3.99	20	\$79.80
6		TOTAL WITH 20	0% DISCOUNT	\$155.44
7		TOTAL WITH \$30 O	FF DISCOUNT	\$164.30



#### Relative references

Sheets predicts how you will want a formula to change if you copy it to a new row or column. If you copy the formula =A1+B1 from row 1 to row 2, the formula will become =A2+B2

1. Enter the formula, =B4\*C4 in this example, and hit Enter

- 2. Drag the fill handle to the cells you want to copy to (or use copy and paste)
- 3. Done! The formula will be copied with relative references





$f_X$	=B4*C4				
	A	В	С	D	
2					
3	MENU ITEM	UNIT PRICE		LINE TOTAL	
4	Empanadas: Beef Picadillo	\$2.99	15	\$44.85	
5	Empanadas: Chipotle Shrimp	\$3.99	10	\$39.90	
6	Tamales: Chicken Tings	\$2.29	20	\$45.80	
7	Tamales: Vegetable	\$2.29	30	\$68.70	
8	Arepas: Carnitas	\$2.89	10	\$28.90	
9	Arepas: Queso Blanco	\$2.49	20	\$49.80	
10	Empanadas: Apple Cinnamon	\$3.19	40	\$127.60	
11	Beverages: Horchata	\$1.89	25	\$47.25	
12	Beverages: Lemonade	\$1.89	35	\$66.15	
13	Beverages: Tamarindo	\$1.89	10	\$18.90	
14			TOTAL	\$537.85	
15					

Make sure to check the copied formulas for accuracy!



#### Absolute references

Say you want to copy a formula but you don't want Sheets to use relative references for a particular value. In this example we'll use cell E2 to calculate 7.5% sales tax for each item in column D

1. Enter the formula, =(B4\*C4)\*\$E\$2 in this example. \$E\$2 is an absolute reference to cell E2 and won't change when the formula is copied

\$2.99 Empanadas: Beef Picadillo \$44.85 5 Empanadas: Chipotle Shrimp \$39.90 \$3.99 \$2.29 \$45.80 Tamales: Chicken Tinga Tamales: Vegetable 8 Arepas: Carnitas \$2.89 10 \$28.90 Arepas: Queso Blanco \$2.49 20 \$49.80 \$127.60 Empanadas: Apple Cinnamon \$3.19 \$47.25 Beverages: Horchata \$1.89 \$66.15 12 Beverages: Lemonade 13 Beverages: Tamarindo \$1.89 \$18.90 2. Drag the fill handle to the cells you want to copy to (or use copy and paste)

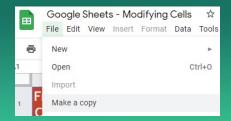
	A	В	С	D	E
2				TAX RATE:	7.5%
3	MENU ITEM	UNIT PRICE	QUANTITY	SALES TAX	LINE TOTAL
	Empanadas: Beef Picadillo	\$2.99	15	\$3.3	\$48.21
5	Empanadas: Chipotle Shrimp	\$3.99	10	G.	\$39.90
	Tamales: Chicken Tinga	\$2.29	20		\$45.80
	Tamales: Vegetable	\$2.29	30		\$68.70
	Arepas: Carnitas	\$2.89	10		\$28.90
	Arepas: Queso Blanco	\$2.49	20		\$49.80
)	Empanadas: Apple Cinnamon	\$3.19	40		\$127.60
	Beverages: Horchata	\$1.89	25		\$47.25
2	Beverages: Lemonade	\$1.89	35		\$66.15
3	Beverages: Tamarindo	\$1.89	10		\$18.90

3. Done! \$E\$2 will remain the same in every formula, while the column B and C cells will change as relative references

$f_X$	=(B4*C4)*\$E\$2					
	A	В	С	D	Е	
2				TAX RATE:	7.5%	
3	MENU ITEM				LINE TOTAL	
4	Empanadas: Beef Picadillo	\$2.99	15	\$3.36	\$48.21	
5	Empanadas: Chipotle Shrimp	\$3.99	10	\$2.99	\$42.89	
6	Tamales: Chicken Tinga	\$2.29	20	\$3.44	\$49.24	
7	Tamales: Vegetable	\$2.29	30	\$5.15	\$73.85	
8	Arepas: Carnitas	\$2.89	10	\$2.17	\$31.07	
9	Arepas: Queso Blanco	\$2.49	20	\$3.74	\$53.54	
10	Empanadas: Apple Cinnamon	\$3.19	40	\$9.57	\$137.17	
11	Beverages: Horchata	\$1.89	25	\$3.54	\$50.79	
12	Beverages: Lemonade	\$1.89	35	\$4.96	\$71.11	
13	Beverages: Tamarindo	\$1.89	10	\$1.42	\$20.32	
14				TOTAL	\$578.19	
15						



#### **Practice!**



- Open the **example file** and click File > Make a copy
- Select the Challenge sheet
- In cell D4, create a formula that will calculate how much the customer would save on each item by multiplying the unit price by the quantity, and then applying discount shown in cell E2
- Use the fill handle or copy and paste to copy the formula you created in the previous step to cells D5:D12



# The spreadsheet should look something like this when you're done:

$f_X$	=B10*C10*\$E\$2	32.		-	
	A	В	С	D	E
1	SABROSA Empanadas & More	Catering Invoice Sabrosa Empana 1202 Biscayne Ba Orlando, FL 3280	y Drive	Invoice #: 5	
2				DISCOUNT:	15.0%
3	ITEM	UNIT PRICE	QUANTITY	DISCOUNT	LINE TOTAL
4	10.5" Extra Thick Dinner Plates - 20 count	\$3.79	15	\$8.53	\$48.32
5	8" Deep Dessert Plates - 15 count	\$3.99	20	\$11.97	\$67.83
6	16 oz. Beverage Cups - 30 count	\$1.29	10	\$1.94	\$10.97
7	12 oz. Styrofoam Coffee Cups - 20 count	\$1.59	15	\$3.58	\$20.27
8	50 count Plastic Spoons - White	\$2.59	6	\$2.33	\$13.21
9	50 count Plastic Forks - White	\$2.69	6	\$2.42	\$13.72
10	50 count Plastic Knives - White	\$2.19	6	\$1.97	\$11.17
11	100 count Dinner Napkins - Blue	\$1.39	3	\$0.63	\$3.54
12	75 count Beverage Napkins - Green	\$1.19	4	\$0.71	\$4.05
13		da da	***	TOTAL	\$193.08



#### Working with functions

Functions are predefined formulas included in Sheets: some common examples include sum, average, count, max, & min

A function is applied to an argument(s), which is just a fancy term for a cell or group of cells

**AVERAGE** 

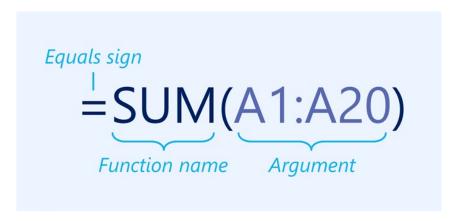
COUNT

ORDERED

12-C MAX

12-0

Find a complete list of functions <u>here</u> or in Sheets:

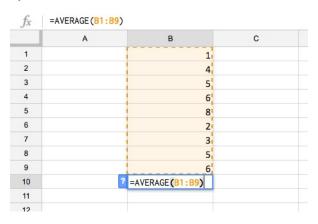




#### Working with functions: examples

Function with a single argument: this function will average cells B1:B9

Note that functions must use parentheses



Function with multiple arguments: this function will add cells in all 3 arguments Note that multiple arguments must be separated by commas

fx.	=SUM(A1:A3,C1	:C2,E1)			
	A	В	С	D	E
1	4		6		20
2	8		10		
3	12				
4					
5 7	=SUM(A1:A3,C1:	C2,E1)			
6					



#### Creating a function

#### Manual method:

1. Enter the function in the cell that will display the calculated value, =SUM(D3:D12) in this example



2. Hit Enter. Done! D3:D12 is summed

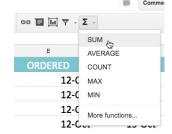
Olive Oli (2.5 galloli)	-	J20.UJ	9114.70
13		TOTAL	\$765.29
14			
15			

#### Using the Functions button:

1. Select the cell range you want to include in the argument, D3:D12 in this example

	A	В	С	D
2	ITEM	QUANTITY	UNIT PRICE	LINE TOTAL
3	Tomatoes (case of 12)	3	\$17.44	\$52.32
4	Black Beans (case of 10)	5	\$20.14	\$100.70
5	All Purpose Flour (50 lb.)	5	\$14.05	\$70.25
6	Corn Meal/Maza (25 lb.)	5	\$18.69	\$93.45
7	Brown Rice (25 lb.)	5	\$10.99	\$54.95
8	Lime Juice (1 gallon)	5	\$11.99	\$59.95
9	Tomato Juice (case of 10)	3	\$19.49	\$58.47
10	Hot Sauce (1 gallon)	8	\$7.35	\$58.80
11	Salsa, Medium (1 gallon)	12	\$8.47	\$101.64
12	Olive Oil (2.5 gallon)	4	\$28.69	\$114.76
13			TOTAL	

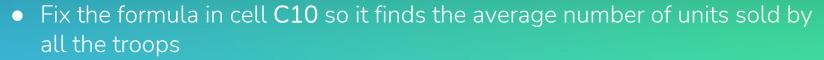
2. Click the Functions button and select the desired function. The function will appear. Hit Enter. Done!



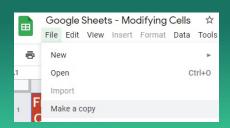


#### Practice!

- Open the example file and click File > Make a copy
- Select the **Challenge** sheet



- In cell C11, write a function that will find the total amount of units sold by all the troops
- In cell C12, write a function that will find the largest number of units sold by a troop





## The spreadsheet should look something like this when you're done:

$f_X$	=MAX(C3:C9)		
	Α	В	С
1	<b>Frontier Kids Coo</b>	kie Sales	
2	Troop Name	Troop ID	Units Sold
3	North Bend	#3506	1004
4	Silver Lake	#2745	938
5	Mountain Top	#1038	745
6	Rocky Trail	#3759	729
7	Forest Path	#4157	862
8	Green Valley	#1932	890
9	River View	#4233	775
10		Average Units	849
11		Total Units	5943
12		Most Sold	1004



#### Sorting and filtering data

- Sorting and filtering is a useful way to reorganize data in your spreadsheet
- Maybe you want to view items in your budget over a certain value, or filter out everyone who hasn't responded to your survey
  - Sort sheet: organizes your entire spreadsheet by one column. In this example, the Name column has been sorted to display names in alphabetical order

	Α	В	С
1	Name	Address	City, State, and Zip
2	Chatuvedi, Rick	4996 Tennessee Ave	Southfield, MI 48034
3	Dean, Hank	4539 Harley Brooks Ln	Salisbury, PA 15558
4	Figgis, Mallory	2381 Wildrose Ln	Southfield, MI 48075
5	Finn, Jake	862 Browning Ln	Syracuse, NY 13221
6	Kinkade, Chris	1979 Davisson St	Indianapolis, IN 46225

Sort range: organizes data only within a selected range of cells. In this example, only the dates have been sorted, leaving the rest of the spreadsheet the same

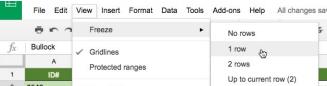
fx					
	A	В	С	D	E
1	Exercises	Se	t 1	Se	t 2
2		Reps	Weight (lbs)	Reps	Weight (lbs)
3	Bench Press	14	65	12	7
4	Bench Press (Decline)	10	60	8	7
5	Triceps Extension	15	35	20	3
6	Average	13.9	50.5	12.5	5
7					
8			Running Log		
9		Date	Distance (miles)	Time (hrs:mins)	
10		26-Jul	2.8	0:45	
11		27-Jul	3	0:44	
12		28-Jul	2.75	0:42	
13		29-Jul	3.25	0:44	
14		30-Jul	3.25	0:45	
15		31-Jul	2.5	0:44	
16		1-Aug	3	0:30	
17		Total	20.55		
18					



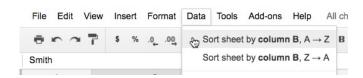
#### Sorting a sheet

#### In this example, we will sort a sheet alphabetically by last name

1. Freeze the header row so the header labels aren't included in the sort



3. Click Data and select how to sort. We'll use Sort Sheet by column, A-Z



2. Choose the column to sort by and click a cell in the column



4. Done! The sheet will be sorted

Α	В	
ID#	Customer Last Name	
2376	Barnes	6 String
3856	Benner	1st Ed.
2549	Bullock	1975 Ph
1945	Bullock	
4732	Carter	50" LED
3056	Chang	
2876	Doan	
1056	Dwivedi	1950s S
4790	Fisher	



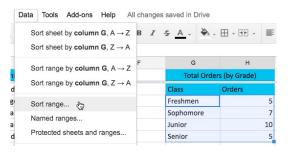
#### Sorting a cell range

In this example, we will sort a secondary table in a T-shirt order form to sort the number of shirts that were ordered by class

1. Select the cell range you want to sort. In our example, G3:H6

	В	С	D	E	F	G	Н	- 1
1	First Name	Last Name	T-Shirt Size	Payment Method		Total Ord	ers (by Grade)	
2	Christiana	Chen	Medium	Check Bounced		Class	Orders	
3	Derek	MacDonald	Large	Cash		Junior	10	
4	Esther	Yaron	Small	Pending		Sophomore	7	
5	Melissa	White	Small	Debit Card		Freshmen	5	
6	Nathan	Albee	Medium	Check		Senior	5,	
7	Sidney	Kelly	Medium	Check				\$
8	Gabriel	Del Toro	Medium	Cash				
9	Kris	Ackerman	Large	Money Order				
10	Matt	Benson	Medium	Money Order				
44	De elec	011	1	Daniella a				

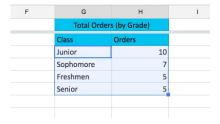
2. Click Data and select Sort range



3. Select the column you wish to sort by and how to sort. We'll use Column H and descending (Z -> A)



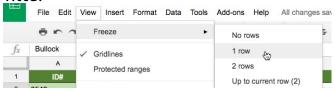
4. Done! The range will be sorted from highest to lowest





#### Creating a filter

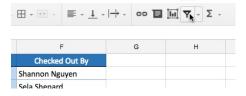
1. Freeze the header row so the header labels aren't included in the filter



2. Click any cell that contains data



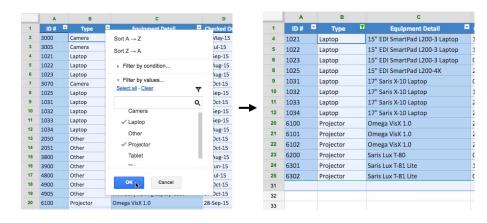
3. Click the Filter button



4. A drop-down menu appears in each column header



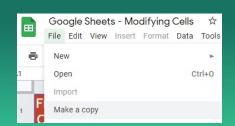
5. Click the drop-down menu for the column you want to filter. In our example, we'll filter to view only certain types of equipment. Done!





#### **Practice!**

- Open the <u>example file</u> and click File > Make a copy
- Select the Equipment log
- Freeze row 1
- Sort the spreadsheet by the Checked Out date from the most recent to the oldest (hint: sort by Column D from Z -> A)
- Sort the range A2:F9 by column B from A -> Z (hint: make sure the box next to "data has header row" is unchecked)
- Filter the spreadsheet so it only shows equipment that has never been checked in (hint: filter column E to show cells that are empty)





## The spreadsheet should look something like this when you're done:

	A	В	С	D	E	F
1	ID# E	Type 🖾	Equipment Detail	Checked Out	Checked In	Checked Out By
2	3070	Camera	Omega PixL Digital Camcorder	06-Oct-15		Min Seung
3	1031	Laptop	17" Saris X-10 Laptop	04-Oct-15		Nick Ortiz
5	4900	Other	7N Light Rolling Laptop Case	04-Oct-15		Jay Peralta
6	4905	Other	7N Heavy Rolling Laptop Case	04-Oct-15		Nick Ortiz
8	1011	Tablet	Saris SlimPro	04-Oct-15		Jay Peralta
10	1012	Tablet	Saris SlimPro	29-Sep-15		August Zorn
15	1032	Laptop	17" Saris X-10 Laptop	19-Sep-15		Stanley Geyer
17	6301	Projector	Saris Lux T-81 Lite	10-Sep-15		Marques Herndon



### Questions?



If you would like a copy of this presentation, please let the instructor know and we will be happy to share.

### TECHMB \*\*\*

Please complete the survey! You must complete the survey to receive your certificate and have a chance to win a free desktop computer.

