



	A	
1		0
2		1
3		2
4		3
5		4
6		5
7		0



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How to Use Excel to Analyze Survey Data

Leslie Carlson

Overview of Workshops

- First workshop: **Logic Models and Measurement**
- Second workshop: **Effective Client Surveys**
- Today: **How to Use Excel to Analyze
Survey Data**

Today

- Introductions
- Some brief Excel basics
- Creating an Excel spreadsheet and doing data entry
- Inspecting and cleaning your data
- Organizing your data for analysis
- Analyzing your data – basic descriptive statistics

Not Covered Today

- How to analyze qualitative data
 - Open-response interview questions
 - Data from interviews or focus groups
- Interpretation -- how to know what the findings mean
- Visual presentation of findings
 - Charts, graphs, infographics

Today's workshop: Presentation + Practice

- Demo and explanation
- Practice on your laptop

Excel Basics

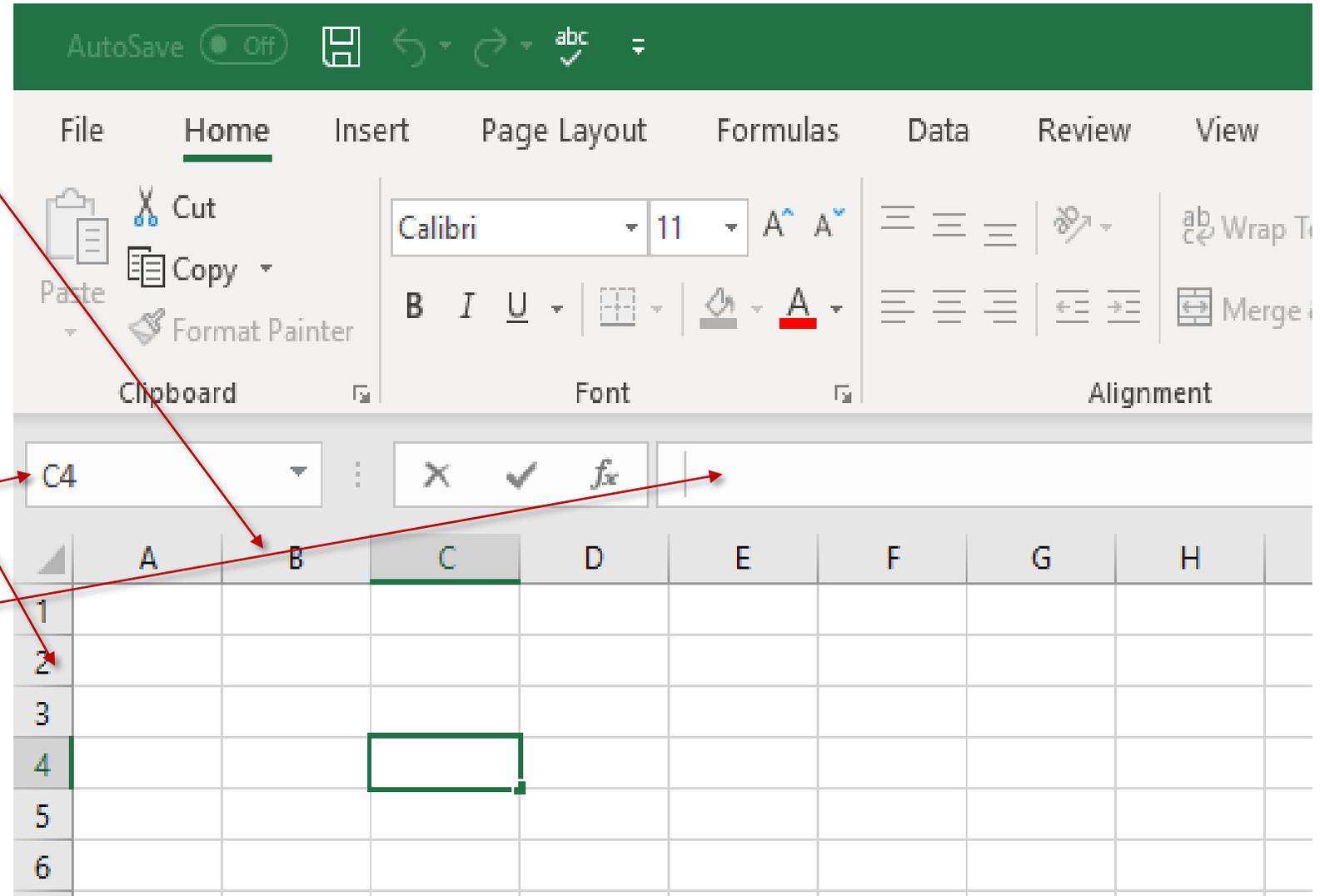
Columns: A, B, C,
etc.

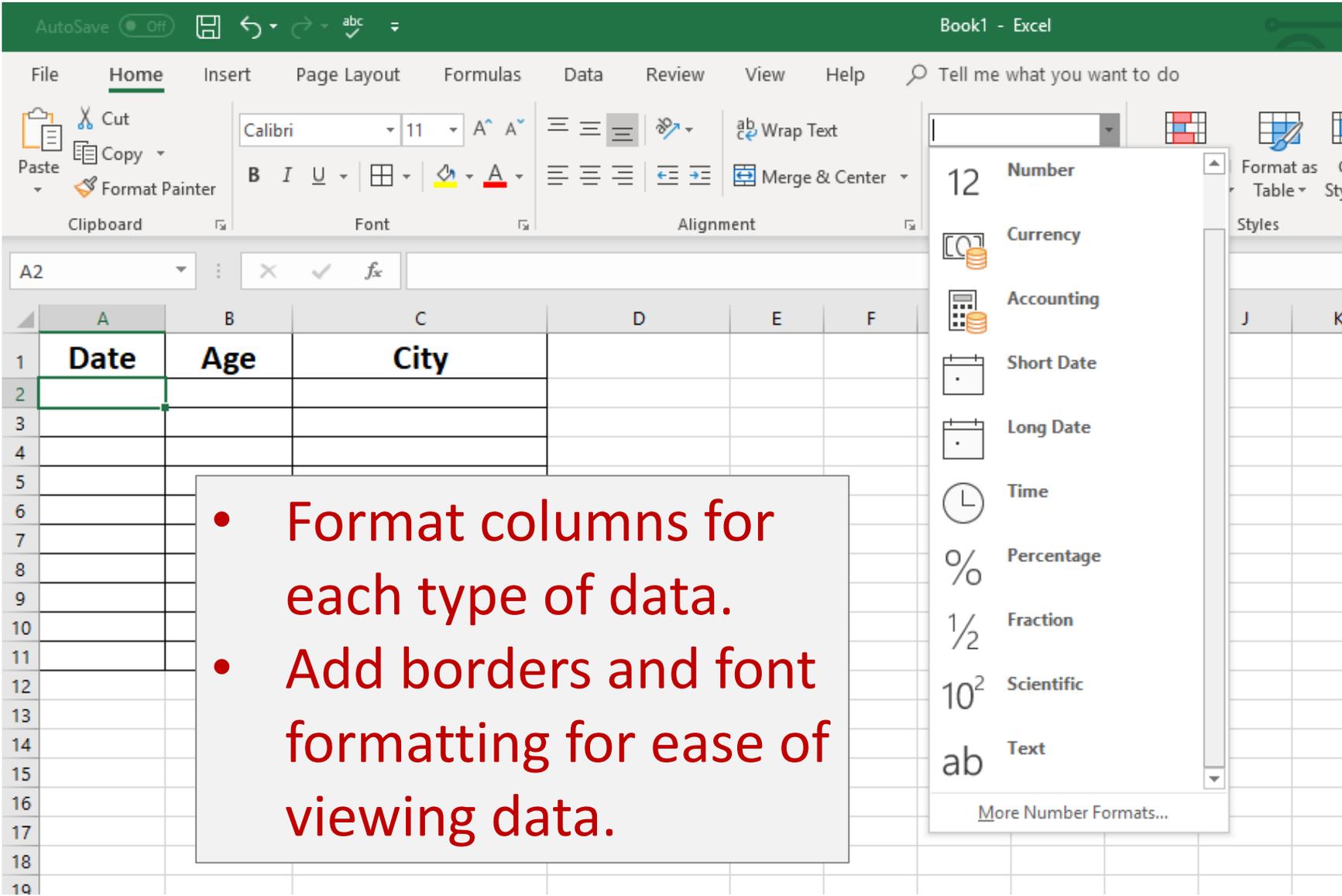
Rows: 1, 2, 3, etc.

Cell address:
Column letter and row
number

- Shown in address window

Formula bar:
Information typed in
cells will also display
here.





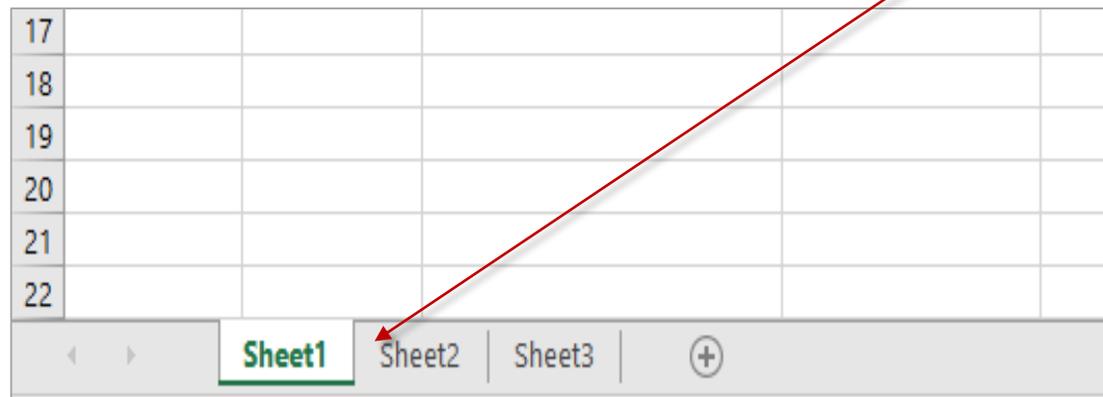
- Format columns for each type of data.
- Add borders and font formatting for ease of viewing data.

Excel File

- Save your Excel file in a secure location
- Give it a clearly-stated file name

Excel Worksheets

- Each Excel file can have multiple worksheets
- Right-click on the tab to name the worksheet



Prepare a spreadsheet for data

- **Columns** – each survey question
- **Rows** – data from each survey

Example – satisfaction survey

Today's Date _____

Program Site

Broadway

Silverbell

During the time you have been in this program:	Always	Most of the time	A few times	Never
1. Did THRIVE provide a welcoming environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Did staff explain things in a way you could understand?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. When you needed to contact a staff member, were you able to reach her/him within 1 – 2 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Did staff respect your ethnic and cultural background?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

File Home Insert Page Layout Formulas Data Review

Cut Copy Format Painter

Clipboard

Calibri 11 A^ A^

B I U Grid Fill Color Background Color

Font

Alignment

L8

X ✓ fx

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5								
6								
7								

	A	B	C	D	E	F	G
1	Survey #	Date	Site	1 - Welcoming	2-Explain	3-Contact	4-Respect
2	1	6/28/18	Broadway	Always	Most of the tin	Most of the tin	Always
3	2	6/28/18	Broadway	Most of the tin	A few times	Most of the tin	Always
4	3	6/28/18	Broadway	Always	Most of the tin	Most of the tin	A few times
5	4	6/28/18	Silverbell	A few times	Never		Most of the time
6	5	6/28/18	Broadway	Always	Most of the tin	Most of the tin	Always
7	6	6/28/18	Silverbell	Most of the tin	A few times	Most of the tin	Always
8	7	6/28/18	Silverbell	Most of the tin	Most of the tin	Most of the tin	A few times
9	8	6/28/18	Silverbell	A few times	Never	Always	Most of the time
10	9	9/26/18	Broadway	Most of the tin	A few times	Most of the tin	Always
11	10	9/26/18	Silverbell	Always	Most of the tin	Most of the tin	A few times

Plan for Data Entry

Identifiers

- If you know the identity of each respondent
 - Unique identifier code for each respondent
- If it's an anonymous survey (respondents not known)
 - Unique survey number for each survey
 - Write a number on each paper survey, and include a matching column for this in the database.
 - If you need to find the paper survey again you can do this with the survey number.

Plan for Data Entry

How will you enter the answers for each question?

- What type of data do you want to have for each question? Some typical kinds of data:
 - Numeric
 - Date
 - Text
- It depends on your analysis plan for each question. Be consistent!
- How to treat missing or wrongly-marked data

Example – satisfaction survey

Today's Date _____

Program Site

Broadway

Silverbell

During the time you have been in this program:	Always	Most of the time	A few times	Never
1. Did THRIVE provide a welcoming environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Did staff explain things in a way you could understand?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. When you needed to contact a staff member, were you able to reach her/him within 1 – 2 days?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Did staff respect your ethnic and cultural background?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	A	B	C	D	E	F	G
1	Survey #	Date	Site	1 - Welcoming	2-Explain	3-Contact	4-Respect
2	1	6/28/18	Broadway	4	3	3	4
3	2	6/28/18	Broadway	3	2	3	4
4	3	6/28/18	Broadway	4	3	3	2
5	4	6/28/18	Silverbell	2	1		3
6	5	6/28/18	Broadway	4	3	3	4
7	6	6/28/18	Silverbell	3	2	3	4
8	7	6/28/18	Silverbell	3	3	3	2
9	8	6/28/18	Silverbell	2	1	4	3
10	9	9/26/18	Broadway	3	2	3	4
11	10	9/26/18	Silverbell	4	3	3	2
12	11	9/26/18	Silverbell	3	1	4	3
13	12	9/26/18	Broadway	2	1	4	3
14	13	9/26/18	Broadway	4	3	3	4

Consistency in data entry

Data Validation

	A	B	C	D	E
1	Survey ID	TodayDate	Q2WhereLive	1 - Welcome	2 - Explain
2	1	3/22/10	Broadway	4	4
3	2	4/20/10	Broadway	3	4
4	3	4/20/10	Broadway	4	4
5	4	4/23/10	Silverbell	4	4
6	5	4/26/10	Silverbell	4	4
7	6	5/17/10	Silverbell	4	4
8	7	5/17/10	Silverbell	4	4
9	8	5/25/10	Broadway	4	4

12. What is your age? _____

13. What is your gender?

- Female
- Male
- Transgender
- Other _____

14. What is your race?

- American Indian/Alaska Native
- Asian
- Black/African American
- Native Hawaiian/Pacific Islander
- White/Caucasian
- Other or multi-racial _____

15. What is your ethnicity?

- Hispanic
- Non Hispanic

Typical Kinds of Program Data

- Numeric
- Date
- Text

Which kind of data is this?

How would you analyze it?

12. What is your age?

- Under age 18
- 18 - 24
- 25 - 55
- 56 - 64
- 65 - 75
- Age 76 or over

O	P	Q	R
Age	Gender	Race	Ethnicity
34	Female	White	Hispanic
21	Male	White	NonHispanic
29	Female	Black	NonHispanic
27	Female	Asian	NonHispanic
31	Male	AI/AN	Hispanic
56	Male	White	NonHispanic
43	Male	Black	NonHispanic
25	Female	White	Hispanic
28	Male	White	Hispanic
37	Female	AI/AN	NonHispanic

Planning for Analysis

Text (also known as **Nominal Data**)

Numbers }
Percentages } “Frequencies”

Numeric Data

Sum

Average

Median

Range

Math – add, subtract, multiply, divide

Planning for Analysis

Dates

Can be used as numeric data (to some extent)

- Subtract an End Date from a Start Date = Duration
- Subtract Date of Birth from Today's Date = Age Today
- Add 30 to Exit Date = Date of one-month follow-up

Plan for Data Entry – “Check all that apply”

8. Which services have you used at the Community Resource Center? (*check all that apply*)

- Case management
- Rent assistance
- Utility assistance
- Resume assistance
- Child care
- Financial education

8. Which services have you used at the Community Resource Center? (*check all that apply*)

- Case management
- Rent assistance
- Utility assistance
- Resume assistance
- Child care
- Financial education

D	E	F	G	H	I
Q8-CaseMgt	Q8-Rent	Q8-Utility	Q8-Resume	Q8-ChCare	Q8-FinEd
1			1	1	1
1	1			1	
	1				
1			1	1	1
		1		1	
1			1	1	
	1				1
1			1	1	
	1				1
1		1		1	
			1	1	1
1	1				1
	1			1	
7	6	2	5	9	6

Open Response Data

You might have a question like this

10. Please tell us one important thing that you learned in the financial education class.

Open Response Data

Type the respondent's exact words in the column for this question. Resize columns and rows as needed, and wrap text to view the answer.

K
Q10 - ImportantLearned
I found out if you do a budget you see where the money goes! Me and my husband had no idea. Good thing he came to becuz he's the worst.

Before Analysis: Inspect Your Data

Missing data

Inconsistencies

Out of range values

If possible, find the correct response and revise

First

Make your data easy to view

- Resize columns and rows
- Apply borders to cells
- Make column headers stand out
- Freeze header row for scrolling
 - On the Ribbon, select View
 - Click the dropdown on Freeze Panes, and select Freeze Top Row.



Next

Make a copy of your original worksheet

You can inspect and change data on the copy, and you can go back to the original if necessary.

1. Right click on worksheet tab, and select Move or Copy.
2. Check the box for Make a Copy
3. Select a location for the copy, and click OK.
4. Rename both worksheets – right-click on worksheet tab, select Rename, type the name, hit Enter.



Do you need to check for duplicates?

In some types of data, unwanted duplicate records could be there. To check for duplicates.

1. Highlight the relevant column (Name or ID number).
2. On the Home tab, select Conditional Formatting, and select Highlight Cell Rules.
3. From the list, select Duplicate Values. Choose a color, and click OK.
4. Scroll down the column to view any duplicates.

A quick way to check for missing or out of range values

Apply a filter

1. Select the entire header row.
2. On the Home tab, on the far right of the ribbon, click on A-Z Sort and Filter. From the dropdown, select ▼ Filter.
3. Now you will have little dropdown arrows on the header name of each column.



Practice

Using a filter

4. Select the dropdown arrow on one of your columns and view the list.
5. Does the dropdown list include the word, “blanks”?
6. Is there anything shown on the list that shouldn't be there?

C	D	E	F
ExitDate	Race	Ethnicity	Gender
3/31/2010	White		
4/1/2010	White		
4/1/2010	White		
7/31/2010	White		
4/1/2010	White		
4/30/2010	Black c		
7/31/2010	White		
6/30/2010	Black c		

The screenshot shows an Excel spreadsheet with columns C, D, E, and F. Column C is 'ExitDate', D is 'Race', E is 'Ethnicity', and F is 'Gender'. The 'Gender' column header is highlighted in green. A dropdown menu is open for the 'Gender' column, showing options for sorting and filtering. The menu includes options for sorting (Sort A to Z, Sort Z to A, Sort by Color), clearing the filter, filtering by color, and text filters. A search box is visible, and a list of filter criteria is shown below it, including '(Select All)', 'F', 'Female', 'M', 'Male', and '(Blanks)'. The 'Blanks' option is highlighted in blue.

Using a filter

To find the problem records:

1. Uncheck "Select All"
2. Select the item that you want to correct, and click OK.
3. Excel will display only the record(s) with the value that you selected.
4. Make corrections, if known.
5. To remove the filter, check "Select All" or unselect the filter.

C	D	E	F
ExitDate	Race	Ethnicity	Gender
3/31/2010	White		
4/1/2010	White		
4/1/2010	White		
7/31/2010	White		
4/1/2010	White		
4/30/2010	Black c		
7/31/2010	White		
6/30/2010	Black c		

The screenshot shows an Excel spreadsheet with columns C, D, E, and F. Column C is 'ExitDate', D is 'Race', E is 'Ethnicity', and F is 'Gender'. The 'Gender' column is filtered to show only 'F' (Female). A context menu is open over the 'Gender' column header, showing options like 'Sort A to Z', 'Sort Z to A', 'Sort by Color', 'Clear Filter From "Gender"', 'Filter by Color', and 'Text Filters'. The 'Filter by Color' option is selected, and a search box is visible below it with 'F' entered. The search results show 'F' and 'Female' selected, while '(Select All)', 'M', 'Male', and '(Blanks)' are unselected.

Another way to use a filter

Organize data onto separate worksheets

This is useful if you want to analyze subsets of respondents.

- Highlight the header row and on the Home tab, select ▼ Filter.
- Select the field that you want to filter, for example, Gender.
- When you have filtered for a particular gender, you can highlight the filtered data, then copy and paste it to another worksheet.
- Name the new worksheet so you remember what it is.
- Go back to the first worksheet and remove the filter. All the data will be there.



Analysis

Where to begin?

It helps to have an analysis plan

- This might be based on reporting requirements from a funder.
- It might also be based on your logic model – what outputs and outcomes you decided were important to measure, and questions important to your leadership and grantwriting team.

Analysis plan for your practice data set

1. The data set represents a fictitious after-school homework help program for 6th – 12th graders.
2. After two months of attendance, participants completed a satisfaction survey.
3. The program included a special component aimed to improve reading for comprehension. A pre-test and post-test was used to measure whether reading improved, and these data were added to the dataset.
4. Participants also brought cans of food for the Community Food Bank, and this was recorded.

Analysis questions for your practice data set

1. What were the demographics of participants who completed surveys?
2. What were the numbers and percentages of students who selected each satisfaction answer option?
3. Did the responses vary by race, ethnicity, or gender?
4. Did the program serve mostly younger teens, or teens of varying ages? What was the average age of participants?
5. Did the program serve those with both good grades and those with poor grades?
6. Did student test scores improve from pretest to post-test?

Numbers and Percentages

Also known as Frequencies

How to count things and do other calculations in Excel

1. How to do **formulas** in Excel.
 - Click in an empty cell – this is where the answer will go
 - Type the = sign to start the formula. For example, =2+2.
 - Hit Enter to complete the formula and get the answer.



Numbers and Percentages

2. How to do **functions** in Excel. A function is a pre-defined formula available in Excel.
 - Click in an empty cell – this is where the answer will go.
 - Click the fx (Insert Function) symbol next to the formula bar.
 - Select the desired function.
 - Select the cell range to be used for the function.
 - If applicable, enter other necessary criteria and hit Enter.



Numbers and Percentages

Some common **functions** in Excel for program analysis.

1. Sum – found in fx list of functions
 - There's also a shortcut for this on the Home tab
 Σ AutoSum
2. Count
3. Countif
4. Countblank
5. Min and Max
6. Average



A Faster Way to Get Frequencies

Pivot Tables

A pivot table can be:

- A one-variable data table with numbers (counts)
- A one-variable data table with numbers and/or percents
- A two-variable data table (cross-tabulation)

Example of a one-variable data table

Were staff helpful when you had questions?	Number
Always	57
Most of the time	65
A few times	43
Never	24
Missing data	1
Total	190

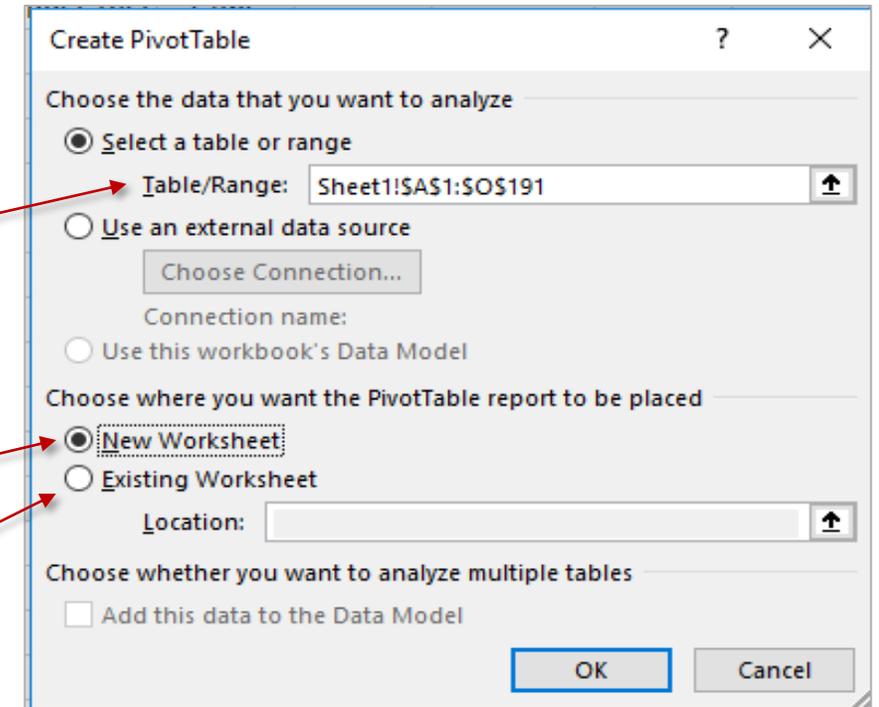
Example of a two-variable data table

Also known as a **Cross-Tab**

Were staff helpful when you had questions?	Female	Male	Total
Always	28	29	57
Most of the time	35	30	65
A few times	25	18	43
Never	11	13	24
Missing	1		1
Total	100	90	190

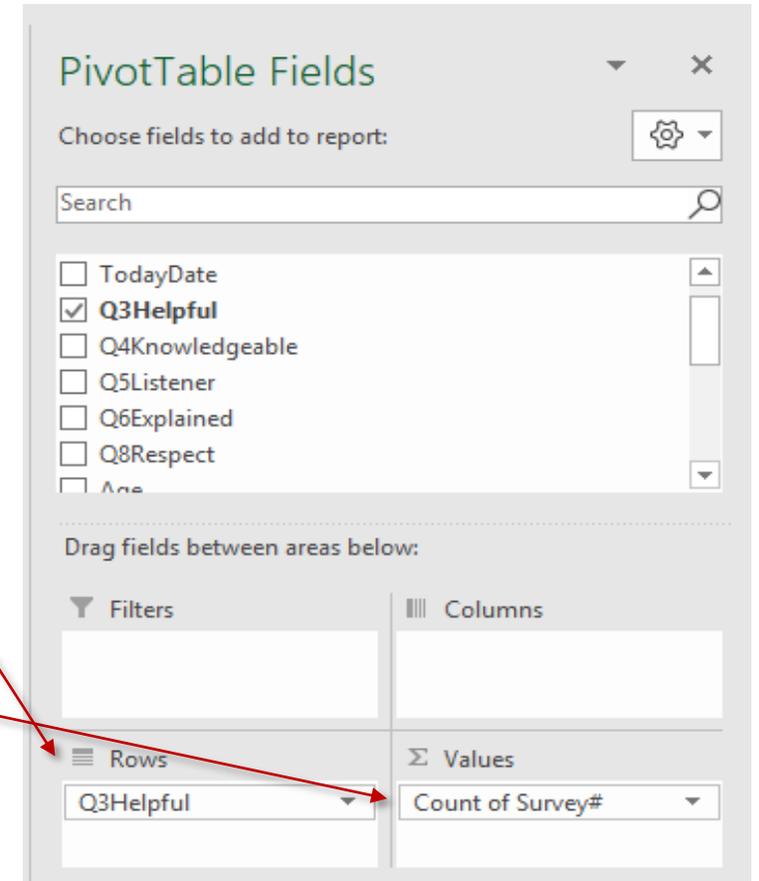
Creating a Pivot Table

1. Click any cell in your dataset
2. Select the Insert Tab on the ribbon
3. On the Insert tab, click PivotTable. A “Create Pivot Table” box will appear.
4. You don't need to select a Table/Range because you already clicked on a cell in your dataset.
5. New Worksheet – pivot table will be created on a newly-inserted worksheet
6. Existing Worksheet – if you check this, click on a cell in an empty area of the current worksheet where you want the pivot table.
7. Click OK.



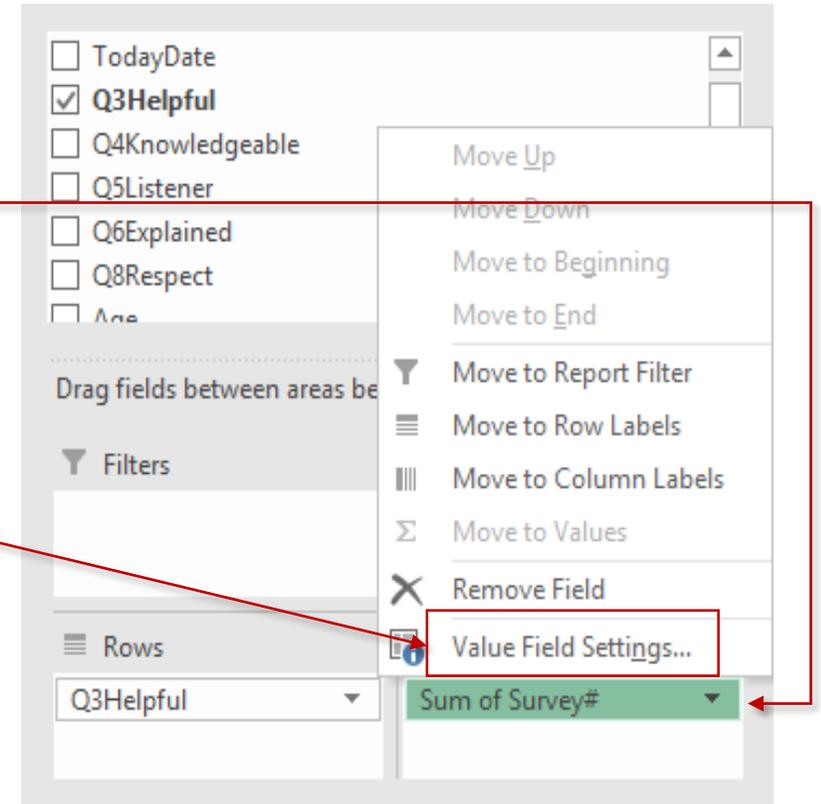
Pivot Table

8. The Pivot Table layout will display.
9. Find the question that you want to use for your data table. Drag it into the Rows window. Your pivot table will begin to form on the left.
10. To get the counts for each answer option, you need to use something in the Values window. Drag Survey# into the Values window.
11. Your table may have numbers that are way too large.



Pivot Table

12. In the Values window, it may say, Sum of Survey# instead of Count of Survey#.
13. Click the dropdown arrow on Sum of Survey#.
14. Select Value Field Settings.
15. From the pop-up box, select Count, and click OK. Now the numbers in your data table will look right.



Arranging Rows in Pivot Table

Excel displays rows in alphabetical order
We want to rows to appear in this order:

Always
Most of the time
A few times
Never

1. Right-click on “Always”
2. From the pop-up menu, hover over “Move”
3. Select “Move ‘Always’ to Beginning.”
4. Repeat until you have the right order.

3	Count of Survey#	
4	Q3Helpful <input type="button" value="▼"/>	Total
5	A few times	43
6	Always	57
7	Most of the time	65
8	Never	24
9	(blank)	1
10	Grand Total	190

Tip for Doing Multiple Pivot Tables

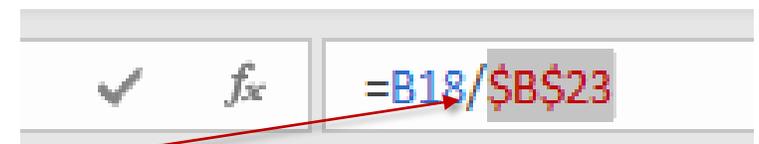
1. After do your first pivot table, highlight it and click Copy.
2. Click on an empty area several rows below the pivot table. On the Home tab, click the dropdown arrow under the Paste icon.
3. Select Paste Values to paste a copy of the first data table.
4. Click into the first (active) Pivot Table again to display the Field List. In the Field List, uncheck the first question that you used, and drag the next question into the rows window.
5. Copy the second pivot table, and use Paste Values to paste a copy, and continue until you have all your tables.

Add Percentages to Data Tables

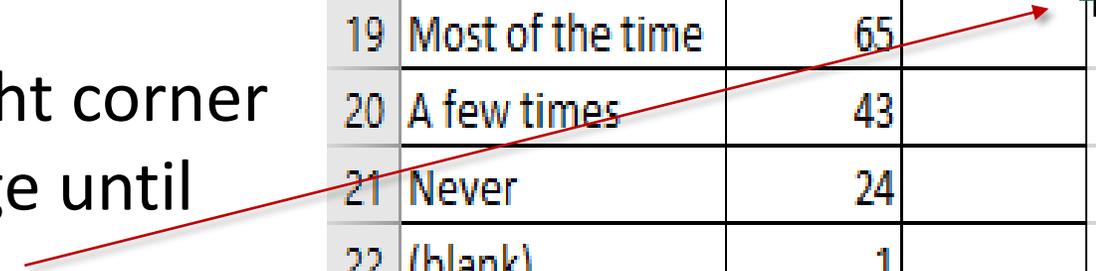
Use a formula to calculate a percentage. $\text{Percent} = \text{Row value} \div \text{Total}$

- In the column to the right of the numbers, type the Excel formula for percent, using the cell addresses for the numerator and denominator.
- The formula will display in the formula bar. Highlight the cell for the denominator and press F4 on your keyboard. This will add \$ symbols to the cell address – this tells Excel to keep this cell address as a constant.

17	Q3Helpful	Number	Percent
18	Always	57	=B18/B23
19	Most of the time	65	
20	A few times	43	
21	Never	24	
22	(blank)	1	
23	Grand Total	190	



Add Percentages to Data Tables

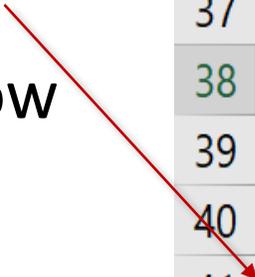
- Your first percent will appear as a decimal. On the Home tab click on the % sign to convert the decimal to a percent.
- Hold your cursor over the lower right corner of the cell containing the percentage until the cursor marker looks like this  
- Drag the cell down and the Excel will auto-calculate the rest of the percentages in the column.

17	Q3Helpful	Number	Percent
18	Always	57	30%
19	Most of the time	65	
20	A few times	43	
21	Never	24	
22	(blank)	1	
23	Grand Total	190	

Valid Percent

- What if you have a data table that looks like this. There are a lot of missing data.
- Missing data is unknown – we don't know what they would have answered.
- When there is this much missing data, it reduces the rest of the percentages, which makes them misleading.

36	Q6Explained	Number	Percent
37	Always	40	21%
38	Most of the time	48	25%
39	A few times	39	21%
40	Never	10	5%
41	(blank)	53	28%
42	Grand Total	190	100%



Valid Percent

- To compute Valid Percent, subtract the missing data from the total to create a new denominator.
- In this example, for Valid Percent, each row value is divided by 137 instead of 190.
- The resulting valid percents give more truthful percentages as a proportion of those whose answers are known.

Q6Explained	Number	Percent	Valid Percent
Always	40	21%	29%
Most of the time	48	25%	35%
A few times	39	21%	28%
Never	10	5%	7%
(blank)	53	28%	
Grand Total	190	100%	100%

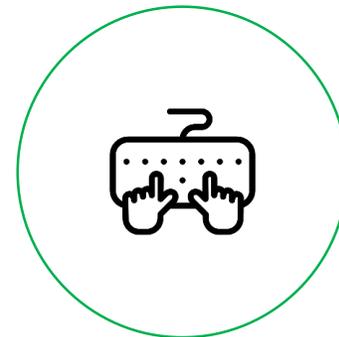
Cross Tab Tables

Analysis Plan question: Did the responses vary by race, ethnicity, or gender?

1. Create a one-variable pivot table
2. Select a second variable for the cross-tab and drag it into the column area.

For practice:

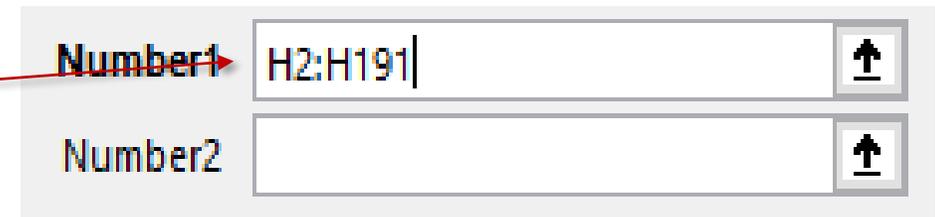
- Create a pivot table for Q3-Helpful
- Add a cross-tab by Gender
- Any patterns? Replace Gender with Race. Any patterns?



Numeric Data

Calculate Average Age

- Click on an empty cell where the answer will appear.
- Click on fx and from the list of functions, select Average, and click OK.
- In the Functions Arguments box, you need to identify the cell range for the calculation. Click on the first cell for Age. Scroll down to the end, hold the shift key, and click the last cell – this is a quick way to highlight the column.
- Or you can type the cell range. In this example it is H2:H191



Number1	H2:H191	↑
Number2		↑

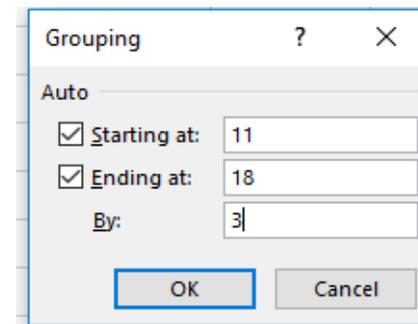
+

Age Ranges

You can ask Excel to put ages into age ranges. There are different methods you might use.

One Method: Use a Pivot Table

- Start a Pivot table and use Age for the rows.
- Right-click on the first age.
- From the pop-up menu, select Group
- In the Grouping Box, make sure that the starting and ending numbers are right. Enter an interval number for grouping ages.



The image shows the 'Grouping' dialog box in Microsoft Excel. It has a title bar with a question mark and a close button. Under the 'Auto' section, there are three checked options: 'Starting at' with a text box containing '11', 'Ending at' with a text box containing '18', and 'By' with a text box containing '3'. At the bottom, there are 'OK' and 'Cancel' buttons.

Age	Total
11-13	65
14-16	91
17-19	34
Grand Total	190

Pre and Post Survey Data

Did you or a member of your grant-writing team write measurable objectives about this?

One Example: *The average reading score of Read4Fun participants will increase by at least 15%.*

- What analysis would you do to report this?

Another Example: *At least 60% of Read4Fun participants will increase their reading scores by 15 points or more.*

- What analysis would you do to report this?

First Example

The average reading score of Read4Fun participants will increase by at least 15%.

- Use the Excel function, “Average” to compute the average pretest score for all participants, and the repeat this to get the average post-test score.
- Is the average post-test score higher? Use a formula to calculate the percentage increase.

Second Example

At least 60% of Read4Fun participants will increase their reading scores by 15 points or more.

- Start a new column and label it ChangeScore.
- Starting with the first participant, create a formula to subtract the pretest score from the post-test score. Use cell addresses.
- Click on the cell with the result, and drag down the rest of the column to auto-calculate this formula for everyone.
- In a blank cell use the “Countif” function to count how many ChangeScore values are greater than or equal to 15.
- Calculate a percent of all participants who had a score of 15 or more.

Questions?

Thank you!