INTERMEDIATE EXCEL

FOR LIFELONG LEARNERS

Expectations

Ready to take your Excel skills to the next level? Our Intermediate Excel Class is designed to build on the foundation laid in the Basic class. In this three-hour session, you'll dive deeper into data management, chart creation, and intermediate functions. Explore sorting, filtering, and the art of visualizing data with charts and graphs. Uncover the power of IF statements and VLOOKUP. By the end of this class, you'll be equipped to tackle more complex Excel tasks with confidence.

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MICROSOFT EXCEL: INTERMEDIATE

DATA MANAGEMENT

Managing data effectively in Excel is like having a well-organized tool shed: you can find what you need when you need it, and you're less likely to trip over a rake. Excel is a powerful tool for number crunching, analysis, and reporting, but its capabilities are only fully realized when data is managed well. Topics like sorting and filtering help you focus on the most important data points, akin to spotlighting the lead actor on a stage. Freezing views lets you keep crucial info on screen while scrolling, as if holding a compass while navigating a map. Validation ensures your data meets specified criteria, much like a bouncer at an exclusive club. Managing duplicates and removing empty cells are the equivalent of decluttering your house—getting rid of what you don't need so you can focus on what you do. All these techniques come together to make you a more efficient and effective Excel user.

ACTIVITY 1: OPEN THE DATA FILE

1. Click **FILE → OPEN → BROWSE**.
2. Navigate to *20-Data* and click **OPEN**.
3. To preserve the original file, click **FILE → SAVE AS → BROWSE**.
4. Navigate to the desired file location and save it with the name *20-Grades*.

DATA VALIDATION

ACTIVITY 2: VALIDATE QUIZ SCORES

1. Select **B2:K46**, which are the cells that need data validation.
2. Click **DATA → DATA TOOLS → DATA VALIDATION**. (Note, click the button, not the down arrow on the right side of the button.)
3. On the Settings tab:
   A) Allow: **WHOLE NUMBER**
   B) Ignore blank: **CHECK**
   C) Data: **BETWEEN**
   D) Minimum: *1*
   E) Maximum: *10*
4. Click the **ERROR ALERT** tab

A) Show error alert after invalid data is entered: **CHECK**

B) Style: **STOP**

C) Title: *Quiz Score*

D) Input Message: *Enter a score between 1 and 10.*

5. Click **OK**.

6. Click **B2** to activate that cell.

7. Enter *19* in **B2** to force an error.

8. Click **CANCEL** on the **Quiz Score** error message.

9. Make sure *10* (the original value) is in **B2**.

10. Select **B2:K46**.

11. Click **DATA → DATA TOOLS → DATA VALIDATION**. (Note, click the button, not the down arrow on the right side of the button.)

12. Click the **ERROR ALERT** tab on the **Data Validation** dialog box.

13. This cell was initially set to Stop on an error. Perhaps it would be acceptable for the user to finish the data entry even if it contained an error. Change the Style drop-down to **WARNING**.

14. Click **OK**.

15. Click **B2** to activate that cell.

16. Enter *19* in **B2**. A warning message pops up, but the user can leave the incorrect score in place.

17. Click **YES** to enter *19* in *B2*.

ACTIVITY 3: FIND INVALID DATA

1. Click **DATA → DATA TOOLS → DATA VALIDATION DOWN ARROW → CIRCLE INVALID DATA**.

2. Notice that **B2** is circled since it contains bad data.

3. Enter *10* in **B2**, the original value, and the validation circle is cleared.

SORT AND FILTER DATA

Spreadsheet data is much easier to work with if its in a table.

ACTIVITY 4: CREATE A DATA TABLE

1. Click **A1** to activate that cell.

2. Click **INSERT → TABLES → TABLE**.

3. Excel analyses the worksheet and determines the correct dimensions for the table. Be sure *My table has headers* is checked, then click **OK**.

4. Excel creates a table with rows of alternating colors. It also activates the *Sort and Filter* drop-down arrows for each row header.

5. Click the top of **COLUMN A** to select that entire column.

6. Hold down the ⎡ *SHIFT* ⎤ key and click the top of **COLUMN Q** to select all of the columns.

7. Double-click between the tops of any two columns to automatically size the widths of all columns.

8. Click **A1** to activate that cell.

9. Save the workbook.

ACTIVITY 5: SORT A DATA TABLE

1. Click the ↓ (down arrow) in the *Total* column header.

2. Click **SORT SMALLEST TO LARGEST**. Notice that *181* and several other scores are repeated. For a *Total* of 181, notice that the *Final* scores are 59, 71, and 57.

3. Click **DATA → SORT & FILTER → SORT**.

4. Select these values.

    A) Sort By: **TOTAL**.

    B) Sort On: **CELL VALUES**

    C) Order: **SMALLEST TO LARGEST**

5. Click **ADD LEVEL** to create a secondary sort field. Select these values.

    A) Then by: **FINAL**

    B) Sort on: **CELL VALUES**

    C) Order: **SMALLEST TO LARGEST**

6. Click **OK**. Notice that the *Total* scores of *181* are now sorted by *Final*.

7. Click the ↓ (down arrow) in the *Student Name* column.

8. Click **SORT A TO Z** to return the worksheet to its original sort order.

9. Save the workbook.

ACTIVITY 6: FILTER A DATA TABLE

1. Click the ↓ (down arrow) in the *Total* column header.

2. Click **NUMBER FILTERS**.

3. Select **TOP 10**

4. Click **OK** to accept the default of *Top 10 Items*.

5. The students with the top ten scores are displayed.

6. Click the ↓ (down arrow) in the *Total* column header.

7. Click **CLEAR FILTER FROM "TOTAL"**.

8. Click the ↓ (down arrow) in the *Total* column header.

9. Click **NUMBER FILTERS**.

10. Explore other settings to filter the *Total Scores*.

11. Click the ↓ (down arrow) in the *Total* column header.

12. Click **CLEAR FILTER FROM "TOTAL"**.

FREEZE ROWS AND COLUMNS

ACTIVITY 7: FREEZE ROWS/COLUMNS

1. Click **A1** to activate that cell.

2. Click **VIEW → WINDOW → FREEZE PANES → FREEZE FIRST COLUMN**

3. Scroll the worksheet to the right and notice that the first column stays visible.

4. Click **VIEW → WINDOW → FREEZE PANES → UNFREEZE PANES**

MANAGE DUPLICATES AND REMOVE EMPTY CELLS.

ACTIVITY 8: ADD DATA

1. Click **A47**.

2. Insert the following data.

    A) Student Name: *DIAZ, Nina*

    B) Quiz Scores: *8*, *9*, *7*, *10*, *6*, *8*, *9*, *7*, *10*, *6*

    C) Test Score: *40*, *41*, *50*

3. If the *Total Score* is not displayed in *O47*, then copy/Paste **O46** to **O47**.

4. Click **A1** to activate that cell.

Search for and remove the duplicate Nina Diaz.

ACTIVITY 9: DELETE DUPLICATE ROWS

1. Click **DATA → DATA TOOLS → REMOVE DUPLICATES**.

2. Make sure **SELECT ALL** is selected and *My data has headers* is checked.

3. Click **OK**.

4. Excel reports that one duplicate value was found (the Nina Diaz row). Click **OK** to remove the duplicate row.

James Smith has a missing grade for Quiz 7. There are many options for correcting missing data, but here are the most commonly-used.

1. **Deletion**: The simplest method is to just remove any record that has missing data. This is quick but would mean that James' entire record would be removed and that is not acceptable.

2. **Average Imputation**: Missing values can be estimates using the average of the other Quiz 7 scores. For example, the average Quiz 7 score is 8, so that could be entered as James' score. This is straightforward but can introduce errors.

3. **Forward/Backward Fill**: In time-series data, gaps can be filled in by using the last known data point forward or backward. Since the quizzes are not a time-series, this would not work in this case.

4. **Leave It Be**: In many cases, missing values can just be left blank. This is the best option for the grade book since James was likely absent on the day the quiz was administered.

INTERMEDIATE FUNCTIONS AND FORMULAS

CALCULATE PERCENTAGES

ACTIVITY 10: CALCULATE TOTALS

1. Click **A1** to activate that cell.

2. Click **TABLE DESIGN → TABLE STYLE OPTIONS → TOTAL ROW**.

3. Click **B47**, the Total for Quiz 1.

4. Click the down-arrow and select **MAX**.

5. Auto-fill to cell **O47**, *Total*.

6. Click **P2** to activate that cell.

7. Enter *=O2/$O$47* (note, this is the letter O, not the number zero).

8. Excel automatically fills the rest of the column.

9. If *Column P* is not displayed as a percentage, select **P2:P46** and **HOME → NUMBER → PERCENTAGE**.

10. Save the workbook.

VLOOKUP FORMULA

ACTIVITY 11: USE VLOOKUP

1. Click **Q2**.

2. Click **FORMULAS → FUNCTION LIBRARY → LOOKUP & REFERENCE → VLOOKUP**.

3. Fill in the dialog box with the following values.

   A) Lookup value: *P2*.

   B) Table array: *$A$53:$B$57*. (This does NOT include the label in Row 52.)

   C) Col index number: *2*.

   D) Range lookup. *Leave blank*.

4. Click **OK**.

5. Excel automatically fills the grades for the entire table.

6. Click **Q47** then the down-arrow.

7. Select **NONE**.

8. Save the workbook.

IF FORMULA

ACTIVITY 12: USE IF

1. Click **R1**.

2. Enter *At Risk*. Excel automatically adds that column to the table.

3. Click **R2**.

4. Click **FORMULAS → FUNCTION LIBRARY → LOGICAL → IF**.

5. Enter the following values.

   A) Logical Test: *P2<0.7*.

   B) Value_If_True: *Fail*. Note: Excel automatically encloses the word in quotes.

   C) Value_If_False: *Pass*. Note: Excel automatically encloses the word in quotes.

6. Click **Ok**.

7. Excel automatically fills the At Risk results for the entire table.

8. Select **R2:R46**.

9. Click **Home → Styles → Conditional Formatting → Highlight Cell Rules → Euqal To**.

10. Enter *Fail* in the first box and leave the second box at its default *Light Red Fill with Dark Red Text*.

11. Click **Ok**.

12. Click **R2**.

13. Save the workbook.

COUNTIF AND COUNTIFS FORMULAS

ACTIVITY 13: USE COUNTIF

1. Enter the following values to create a *Grade Analysis* table.

   A) **U5** to **X5**: *Grade*, *Test 1*, *Test 2*, *Final*

   B) **T6** to **T10**: *A*, *B*, *C*, *D*, *F*

2. Select **T6:T10** to activate those cells.

3. Click **Home → Font → Bold**.

4. Select **U5:X5** to activate those cells.

5. Click **Home → Font → Bold**.

6. Click the top of *Column T* then hold the **SHIFT** key and click the top of *Column X*.

7. Double-click between the tops of any two columns to auto-adjust the width of those columns.

8. Click **U6** to activate that cell.

9. Click **Formulas → Function Library → More Functions → Statistical → Countif**.

   A) Range: *$Q$2:$Q$46*

   B) Criteria: *"A"*

   C) Click **Ok**.

10. Autofill *U6* to **U7:U10**.

11. Click **U7** to activate that cell.

12. Click in the formula bar and change *"A"* to *"B"*.

13. Click in **U8** to activate that cell.

14. Click in the formula bar and change *"A"* to *"C"*.

15. Click in **U9** to activate that cell.

16. Click in the formula bar and change *"A"* to *"D"*.

17. Click in **U10** to activate that cell.

18. Click in the formula bar and change *"A"* to *"F"*.

19. If this is done correctly, find A=10, B=11, C=14, D=6, and F=4.

20. Save the workbook.

ACTIVITY 14: USE COUNTIFS

1. Click **V6** to activate that cell.

2. Click **FORMULAS → FUNCTION LIBRARY → MORE FUNCTIONS → STATISTICAL → COUNTIFS**.

   A) Criteria_range1: *L$2:L$46*

   B) Criteria1: *">="&0.9*L$47*

   C) Criteria_range2: *L$2:L$46*

   D) Criteria2: *"<="&L$47*

   E) Click **OK**.

3. Copy **V6** to **V7**.

4. Click **V7** to activate that cell.

5. Click the *fx* button in the formula bar and make these changes.

   A) Criteria1: *">="&0.8*L$47*

   B) Criteria2: *"<="&0.89*L$47*

6. Click **OK**.

7. Copy **V7** to **V8**.

8. Click **V8** to activate that cell.

9. Click the *fx* button in the formula bar and make these changes.

   A) Criteria1: *">="&0.7*L$47*

   B) Criteria2: *"<="&0.79*L$47*

10. Click **OK**.

11. Copy **V8** to **V9**.

12. Click **V9** to activate that cell.

13. Click the *fx* button in the formula bar and make these changes.

A) Criteria1: *">="&0.6*L$47*

B) Criteria2: *"<="&0.69*L$47*

14. Click **OK**.

15. Click **V10** to activate that cell.

16. Click **FORMULAS → FUNCTION LIBRARY → MORE FUNCTIONS → STATISTICAL → COUNTIF**.

A) Range: *L$2:L$46*

B) Criteria: *"<="&0.59*L$47*

17. Click **OK**.

18. When completed, the values for **V6:V10** should be *13, 10, 9, 7, 6*.

19. Select **V6:V10**.

20. Auto-fill to **W6:X10**.

21. When completed, the values for **W6:W10** should be *17, 10, 7, 5, 3* and the values for **X6:X10** should be *6, 9, 10, 11, 6*.

22. Click **T5**.

23. Save the workbook.

WORK WITH DATES

ACTIVITY 15: USE DATES

1. Tap **CTRL** + **HOME** to activate cell **A1**.

2. Click **INSERT → TEXT → HEADER & FOOTER**.

3. In the left section of the header, enter: *Date Prepared:*

4. Click **HEADER & FOOTER → HEADER & FOOTER ELEMENTS → CURRENT DATE**.

5. In the center section of the header, enter *Class Report*.

6. In the right section of the header, enter *Page:*

7. Click **HEADER & FOOTER → HEADER & FOOTER ELEMENTS → PAGE NUMBER**.

8. Click **A1**.

9. Click the **NORMAL** page view button in the bottom right corner of the window.

10. Activate Print Preview to see the header.

A) Click **FILE → PRINT**.

B) Click the **CIRCLED ARROW** in the top left corner of the print preview.

11. Save the workbook.

TEXT FUNCTIONS FOR DATA MANIPULATION.

ACTIVITY 16: CONVERT TEXT TO COLUMNS

1. Click **B1** to activate that cell.
2. Click **HOME → CELLS → INSERT DOWN ARROW→ INSERT TABLE COLUMNS TO THE LEFT**. (Note: The *Insert* button is grayed out, but the ↓ (down arrow) still functions.)
3. Select **A2:A46**.
4. Click **DATA → DATA TOOLS → TEXT TO COLUMNS**.
   A) Step 1 of 3 in the Wizard: Click **NEXT**.
   B) Step 2 of 3 in the Wizard: Check *Comma* and click **NEXT**.
   C) Step 3 of 3 in the Wizard: Click **FINISH**.
5. Click **B1** to activate that cell.
6. Click **HOME → CELLS → INSERT → INSERT TABLE COLUMNS TO THE LEFT**. (Note: *Row 2* becomes very large due to the information in Column T, but this will be repaired in a future step.)
7. Click **B2** and enter this formula: *=PROPER(A2)*.
8. Select **B2:B46**.
9. Click **HOME → CLIPBOARD → COPY**.
10. Click **A2** to activate that cell.
11. Click **HOME → CLIPBOARD → PASTE DOWN ARROW → PASTE VALUES**.
12. Tap the `Esc` key to stop the "Marching Ants."
13. Click **B1** to activate that cell.
14. Click **HOME → CELLS → DELETE DOWN ARROW → DELETE TABLE COLUMNS**.
15. Click **C1** to activate that cell.
16. Click **HOME → CELLS → INSERT DOWN ARROW → INSERT TABLE COLUMNS TO THE LEFT**. (Notes: The *Insert* button is grayed out, but the ↓ (down arrow) still functions. *Row 2* becomes very large due to the information in Column T, but this will be repaired in a future step.)
17. Click **C2** and enter this formula: *=TRIM(B2)*
18. Select **C2:C46**.
19. Click **HOME → CLIPBOARD → COPY**.
20. Click **B2** to activate that cell.
21. Click **HOME → CLIPBOARD → PASTE DOWN ARROW → PASTE VALUES**.

22. Tap the Esc key to stop the "Marching Ants."

23. Click **C1** to activate that cell.

24. Click **HOME → CELLS → DELETE DOWN ARROW → DELETE TABLE COLUMNS**.

25. Click **A1** and enter *Last Name*.

26. Click **B1** and enter *First Name*.

27. Select the entire workbook by clicking the triangle in the top-left corner of the cells.

28. Double-click between the tops of any two columns to auto-adjust the width of all columns.

29. Save the workbook.

CHARTS AND GRAPHS

One of the most important things to consider when using charts in Excel is that they are intended to be used for communicating an idea to an audience, whether that audience is reading a written report or listening to a presentation. Although no rules are set for using specific charts for certain data types, some are designed to communicate particular messages better than others.

CREATE DIFFERENT CHART TYPES

ACTIVITY 17: CREATE A COLUMN AND LINE GRAPH

1. Select **C1:L2**.

2. Click **INSERT → CHARTS → COLUMN CHART DOWN ARROW → 2-D COLUMN → CLUSTERED COLUMN** (this is the first option from the Column Chart list).

3. Observe the chart, then tap $DELETE$ to remove it.

4. Select **C1:L3**.

5. Click **INSERT → CHARTS → COLUMN CHART DOWN ARROW → 2-D COLUMN → CLUSTERED COLUMN** (this is the first option from the Column Chart list).

6. Right-click the chart and select **MOVE CHART** in the context menu.

7. Select **NEW SHEET** and name the sheet *Quiz Chart*.

8. Click **OK**.

9. Click the **QUIZ CHART** tab to open it.

10. Click **CHART DESIGN → SWITCH ROW/COLUMN**.

11. Click the *Chart Title* two times, then edit it to read *Quiz Scores*.

12. Click the legend then **Home → Font → Size 11**.

13. Click **Chart Design → Data → Select Data**.

14. Click **Series1** in the left box, then **Edit**.

15. For the *Series name*, enter *=Grades!$A$2*. Do not change *Series values*.

16. Click **Ok**.

17. Click **Series2** in the left box, then **Edit**.

18. For the *Series name*, enter *=Grades!$A$3*. Do not change *Series values*.

19. Click **Ok** two times.

20. Click **Chart Design → Type → Change Chart Type**. Change the chart to a *Line Chart* and *Bar Chart* to see those types of charts. Explore a few of the other charts. Finally, change the chart back to *Column Chart*.

21. Explore a few of the *Chart Styles* options to see how they change the chart. Choose a pleasant chart style.

22. Explore the options available with the *Change Colors* button. Chose a pleasant color combination.

23. Save the workbook.

ACTIVITY 18: CREATE AND FORMAT A PIE CHART

1. Click the **Grades** worksheet to activate it.

2. Select **U5:V10**.

3. Click **Insert → Charts → Pie → The First 2-D Option**.

4. To make the "slices" stand out better, choose to "explode" the pie chart using the following steps.

   A) Click and hold the mouse button down on any of the pie slices. Note that there is a selection handle on each of the pie slices.

   B) Without letting go of the mouse button, drag one of the slices away from the center.

   C) All slices "explode" out from the center.

   D) Note: if the mouse button is released and clicked a second time before dragging a "slice" of the pie, then only that one slice will move. If this happens accidentally, click Undo and try again.

5. Click off the slices and then click the white canvas to deselect the pie and select the entire chart.

6. Click and drag the pie chart, so the upper left corner is in the middle of cell **V12**.

7. Resize the chart using the following values. Press $\boxed{ALT}$ while dragging the resize handle on each side of the chart.

Chart Side	Locked To
Top	Top of Row 12
Left	Left of Column V
Bottom	Bottom of Row 26
Right	Right of Column AB

8. Click the chart legend once and tap $\boxed{DELETE}$. A pie chart typically shows labels next to each slice, so the legend is unnecessary.

9. Right-click any of the slices in the pie chart and select **ADD DATA LABELS**.

10. Right-click one of the numbers added to the pie chart and select **FORMAT DATA LABELS** from the list. The *Format Data Labels* pane will open.

11. Check the boxes for **CATEGORY NAME** and **PERCENTAGE**, and then uncheck the **VALUE** box.

12. Click the **CLOSE** button at the top of the *Format Data Labels* pane.

13. Click on one of the labels, then click **HOME → FONT → BOLD**.

14. The labels can be repositioned and resized to make them easier to read.

15. Save the workbook.

ACTIVITY 19: CREATE A FREQUENCY COMPARISON CHART

1. Select **U5:Y10**.

2. Click **INSERT → CHARTS → RECOMMENDED CHARTS** and select the **FIRST OPTION**.

3. Click **OK**.

4. Click and drag the chart so the upper left corner is in the middle of cell **V28**.

5. Resize the chart using the following values. Press Alt while dragging the resize handle on each side of the chart.

Chart Side	Locked To
Top	Top of Row 28
Left	Left of Column V
Bottom	Bottom of Row 42
Right	Right of Column AC

6. Change the chart title to *Grade Distribution Comparison*.

7. Save the workbook.

FORMAT CHARTS AND AXES

ACTIVITY 20: FORMAT A CHART AXIS

1. With the *Grade Distribution Comparison* chart selected, click **CHART DESIGN → LOCATION → MOVE CHART**.

2. Select **NEW SHEET** and name the sheet *Grade Distribution Chart*.

3. Click **OK**.

4. Switch to the *Grade Distribution Chart* worksheet and click anywhere on the chart.

5. Click anywhere along the X-Axis (Horizontal Axis) to select it.

6. Right-click and select **FONT**.

7. Change the *Font Style* to **BOLD** and the *Size* to **10**.

8. Click **OK**.

9. Click the *Y-Axis* (Vertical Axis) to activate it.

10. Right-click and select **FONT**.

11. Change the *Font Style* to **BOLD** and the *Size* to **10**.

12. Click **OK**.

13. Right-click on the *Chart Title* and select **FONT**.

14. Change the *Font Style* to **BOLD** and the *Size* to **16**.

15. Right-click the *Legend* and select **FONT**.

16. Change the *Font Style* to **BOLD** and the *Size* to **14**.

17. Right-click on the *Chart Title* and select **FORMAT CHART TITLE**.

18. Under *Title Options* in the *Effects* group (the option in the middle), select **SHADOW → PRESET -> FIRST OUTER**.

19. For shadow color, select **Blue, Accent 1**.

20. Click the **Close** button at the top of the *Format Chart Title* pane.

21. Save the workbook.

ACTIVITY 21: FORMAT AXIS TITLES

1. Click anywhere on the *Grade Distribution Comparison* chart.

2. Click **Chart Tools Design → Chart Layouts → Add Chart Element → Axis Titles → Primary Vertical**.

3. Using **Home → Font**, change the font of the axis title to **Bold**, Size **11**.

4. Change the title to *Number of Students*.

5. Click **Chart Tools Design → Chart Layouts → Add Chart Element → Axis Titles → Primary Horizontal**.

6. Using **Home → Font**, change the font of the axis title to **Bold**, Size **11**.

7. Change the title to *Earned Grade*.

8. Save the workbook.

ACTIVITY 22: FORMAT THE DATA SERIES

1. Right-click any yellow bars representing the *Final* data series and select **Format Data Series**.

2. Click the *Fill and Line* (paint bucket) button.

3. Click the word **Fill** to expand the list of Fill options.

4. Select **Pattern Fill**.

5. Select **Dotted: 30%** (fifth column, top row). Changing the fill pattern to a pattern makes distinguishing between the data series easier when the chart is printed or viewed in black and white. Experiment with the fill pattern by selecting different foreground and background colors.

6. Click **Foreground** color and change it to **Green, Accent 6, Darker 50%**.

7. Click the **Close** button at the top of the *Format Data Series* pane.

8. Save the workbook.

ACTIVITY 23: ADD DATA LABELS

1. Click near the edge of the chart to ensure that the entire chart is selected.

2. Click **CHART TOOLS DESIGN → CHART LAYOUTS → ADD CHART ELEMENT → DATA LABELS → OUTSIDE END**.

3. Click on one of the *Data Labels* for the first data series. Notice that all the data labels for that data series are selected.

4. Using **HOME → FONT**, change the font to **BOLD**.

5. Click on one of the data labels for each of the other series and also change them to **BOLD**.

6. Each data label can be moved slightly to make it more readable. To move a data label, click it twice and drag it as necessary.

7. Save the workbook.

SUMMARY

You've honed invaluable Excel skills for organizing, analyzing, and visualizing data. From sorting and filtering to IF statements and charts, these techniques will serve you well. Don't stop here though - take your Excel abilities even further. Our Advanced Excel course will equip you with industry-leading skills like PivotTables, what-if analysis, and data protection. Sign up today! Keep this handout for reference as you continue applying your intermediate knowledge to real-world situations. Excel expertise awaits you - grasp it!

APPENDIX: MORE INFORMATION ABOUT CHARTS

Here's an listing of advanced chart techniques, along with data visualization best practices.

1. **Combination Charts**: These charts combine two or more chart types, like a column and a line chart, to provide multiple perspectives on data. These are useful for comparing different data sets with distinct scales.

2. **Pivot Charts**: Created from pivot tables, these charts allow dynamic data analysis. They are great for summarizing large data sets and can be easily updated as data changes. This type of chart is covered in the "Excel Advanced" class.

3. **Advanced Chart Features**: Utilizing features like secondary axes helps to plot datasets with different scales on the same chart. Other techniques include trendlines, used for forecasting trends, and error bars, that indicate the variability of the data.

4. **Interactive Charts**: Slicers and form controls can be added to charts for interactive data exploration. They enable users to filter and change the data being displayed dynamically.

5. **Custom Chart Templates**: Chart designs can be saved as templates for consistent styling and quick application in future charts. This ensures uniformity in the presentation of multiple charts.

6. **Data Visualization Best Practices**:

   1. **Consistency**: Use consistent colors and styles for similar data points across charts.

   2. **Clarity**: Avoid cluttering; keep the design simple and the data easy to read.

   3. **Labeling**: Properly label axes, data series, and include a legend when necessary.

   4. **Color Choice**: Use colors wisely to enhance readability, not distract. Avoid using too many colors.

   5. **Focus on Data**: Ensure the design highlights the data, not overshadows it.

   6. **Accessibility**: Consider color-blind friendly palettes and clear, readable fonts.