Excel 2007 Intermediate

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Course Objectives – Excel 2007 Intermediate

At the end of this course, participants will be able to:

- Sort data
- Filter data
- Work with subtotals
- Format worksheets effectively
- Use Conditional Formatting
- Format multiple worksheets
- Use the function wizard to perform additional functions
    - Payment
    - IPMT
    - PPMT
    - PV
    - FV
    - Rate
    - NPER
    - IF and Nested IF statements
- Work with comments
- Audit worksheets
- Use Consolidation
- Customize Excel's Default Settings
- Create Custom Lists

Working with Data

Excel 2007 has many convenient features for working with data and summarizing large worksheets.

Subtotals

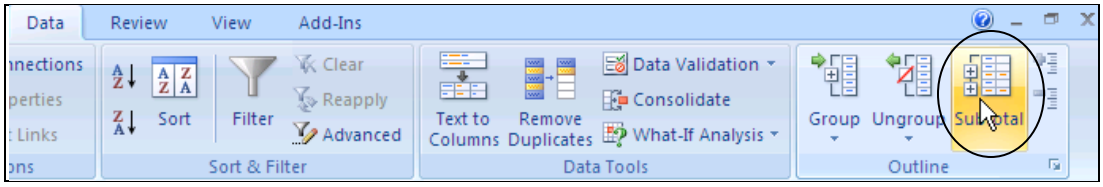
Excel can create subtotals based upon your column headings. This can be a great way to quickly analyze your data. The data sheet needs to have some common fields, e.g., month, year, division, state, etc. so that you can subtotal by a specific field.

Note: You CANNOT apply the subtotals feature to a worksheet that has been formatted as a table (see page 3). You can, however, use the format as table option after applying subtotals.

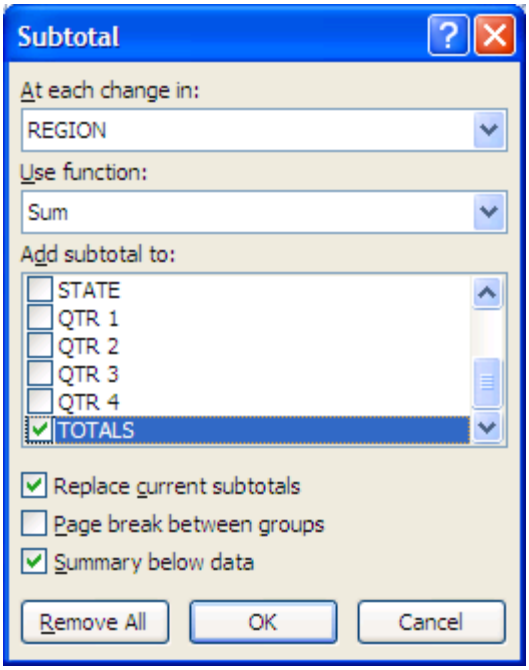
1. Sort your data first by the main column you want to use for your subtotals (e.g., Region).

2. Click anywhere in the list you want to subtotal.

3. From the **Data** tab, select Subtotals.

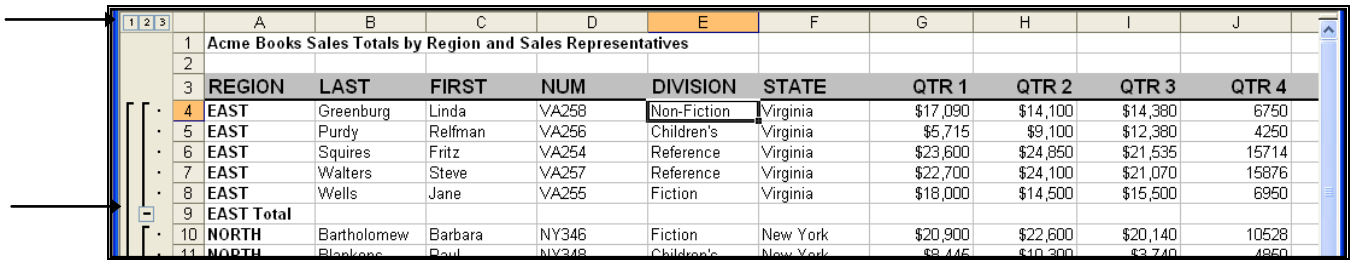


The ***Subtotal*** dialog box displays.



4. Select the desired options. **Note**: To use multiple subtotals for different columns, deselect "Replace current subtotals."

5. Click **OK**. A screen similar to the following displays.



	A	B	C	D	E	F	G	H	I	J
1	Acme Books Sales Totals by Region and Sales Representatives									
2										
3	REGION	LAST	FIRST	NUM	DIVISION	STATE	QTR 1	QTR 2	QTR 3	QTR 4
4	EAST	Greenburg	Linda	VA258	Non-Fiction	Virginia	$17,090	$14,100	$14,380	6750
5	EAST	Purdy	Relfman	VA256	Children's	Virginia	$5,715	$9,100	$12,380	4250
6	EAST	Squires	Fritz	VA254	Reference	Virginia	$23,600	$24,850	$21,535	15714
7	EAST	Walters	Steve	VA257	Reference	Virginia	$22,700	$24,100	$21,070	15876
8	EAST	Wells	Jane	VA255	Fiction	Virginia	$18,000	$14,500	$15,500	6950
9	EAST Total									
10	NORTH	Bartholomew	Barbara	NY346	Fiction	New York	$20,900	$22,600	$20,140	10528
11	NORTH	Blankens	Paul	NY348	Children's	New York	$8,445	$10,300	$3,740	4850

6. If desired, click the 1 2 3 buttons to expand or collapse the information. (You can also click + or – to expand or collapse a single category of information.) If you used multiple subtotals, more outline options display.

   Note: You can print this view, if desired.

Removing Subtotals

To remove subtotals, from the **Data** tab, select Subtotals. The ***Subtotal*** dialog box displays. Click Remove All.

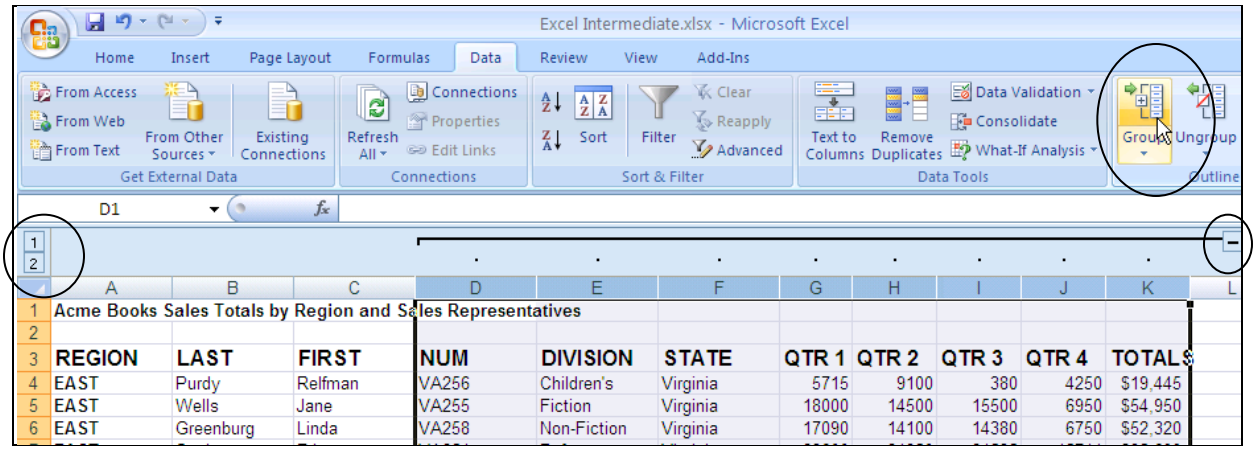
Grouping Columns or Rows

Excel 2007 makes it easy to group data in a large worksheet to make it more manageable.

1. Select the columns or rows you want to group.

2. From the **Data** tab, select Group.

3. The data is grouped and you are provided with **–** and **+** buttons to expand or collapse your grouped data. There are also numbered buttons in the upper-left corner of your worksheet to allow you to expand and collapse, depending upon how many groupings you have created.



	A	B	C	D	E	F	G	H	I	J	K	L
1	Acme Books Sales Totals by Region and Sales Representatives											
2												
3	REGION	LAST	FIRST	NUM	DIVISION	STATE	QTR 1	QTR 2	QTR 3	QTR 4	TOTALS	
4	EAST	Purdy	Relfman	VA256	Children's	Virginia	5715	9100	380	4250	$19,445	
5	EAST	Wells	Jane	VA255	Fiction	Virginia	18000	14500	15500	6950	$54,950	
6	EAST	Greenburg	Linda	VA258	Non-Fiction	Virginia	17090	14100	14380	6750	$52,320	

Ungrouping Data

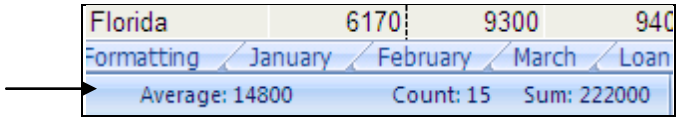
To ungroup data, click the **Ungroup** button.

Note: You can print a grouped worksheet as displayed on your screen.

AutoCalculate – Customize Status Bar

You can have Excel perform a quick calculation for you. This does not enter a result in a cell, but quickly displays a result for you on the Status bar.

1. Select the range of cells you want to autocalculate. The Status bar displays information for the selected cells (Average, Count, Sum).



To add additional options or functions to the Status bar, right-click the Status bar and select the features you would like to display from the Customize Status Bar Options menu.

Format as Table – Filters and Sorting

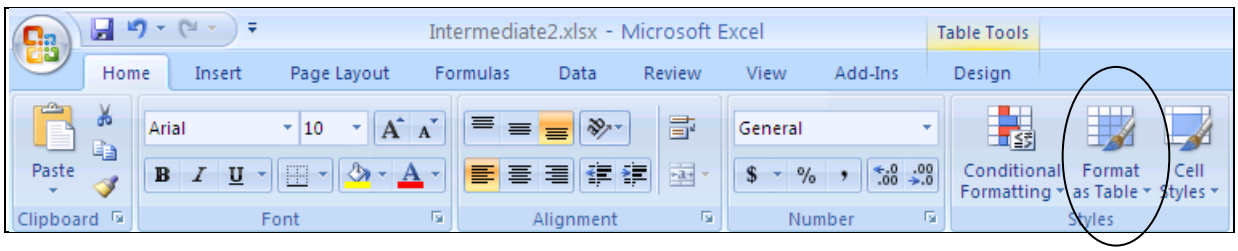
A new feature of Excel 2007 is the "Format as Table" option. This is very useful when working with large amounts of data. It adds quick sort and filter tools on all column headings. It also provides formatting options such as shading of alternate rows. If you add a row or column, the formatting adjusts automatically to modify the shading scheme to adapt to the new content.

1. Open the datasheet you want to format. To use the Format as Table option, each column should have a heading describing the content beneath.

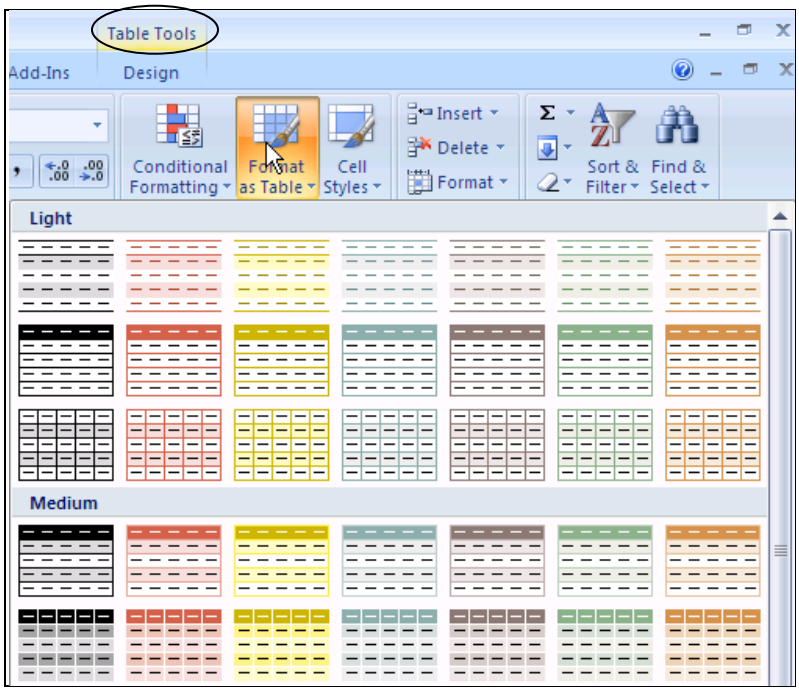
2. Click anywhere in the data list.

	A	B	C	D	E	F	G	H	I	J	K
1	Acme Books Sales Totals by Region and Sales Representatives										
2											
3	REGION	LAST	FIRST	NUM	DIVISION	STATE	QTR 1	QTR 2	QTR 3	QTR 4	TOTALS
4	EAST	Greenburg	Linda	VA258	Non-Fiction	Virginia	$17,090	$14,100	$14,380	$6,750	$52,32
5	EAST	Purdy	Relfman	VA256	Children's	Virginia	$5,715	$9,100	$12,380	$4,250	$31,44
6	EAST	Squires	Fritz	VA254	Reference	Virginia	$23,600	$24,850	$21,535	$15,714	$85,69

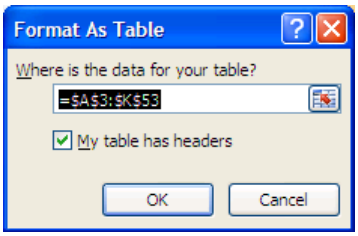
3. From the **Home** tab, select Format as Table.



The following options display. A **Table Tools** context sensitive tab displays with formatting options.



4. Select the desired format. The following dialog box displays indicating that Excel has selected the entire contiguous range of data.



5. Click **OK**. The new format is applied with buttons to apply sorting and filtering options.

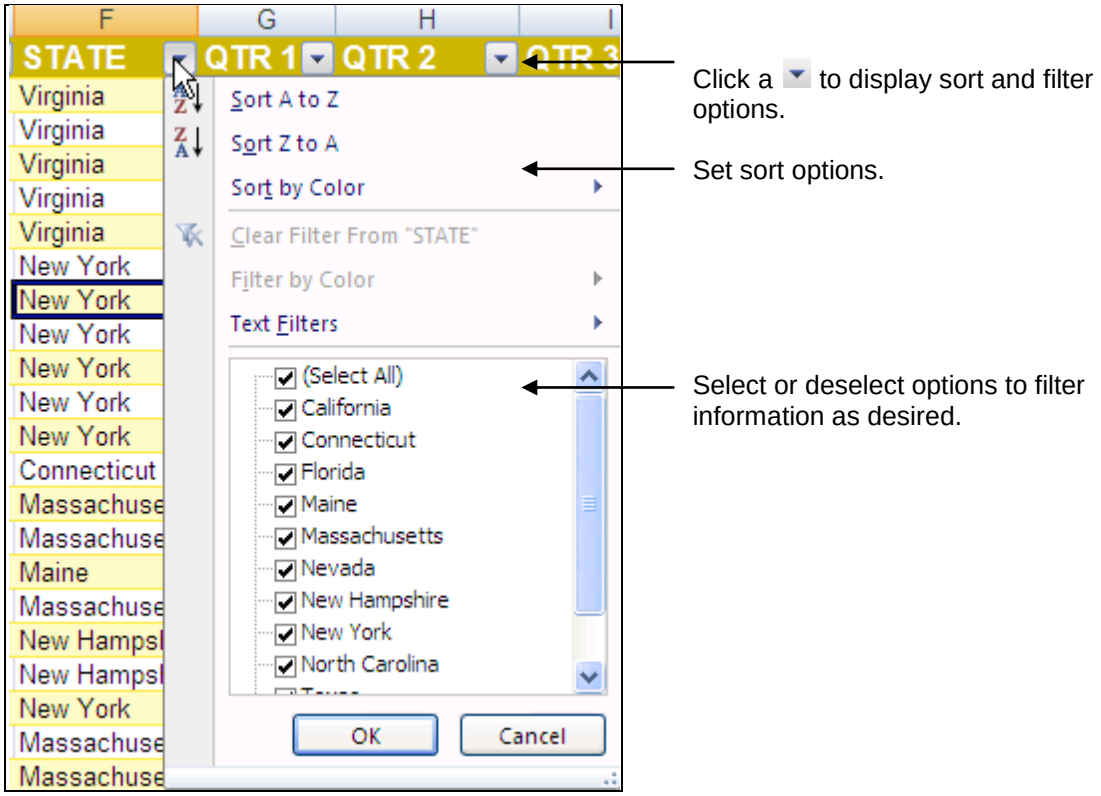
	A	B	C	D	E	F	G	H	I	J	K
3	REGION	LAST	FIRST	NUM	DIVISION	STATE	QTR 1	QTR 2	QTR 3	QTR 4	TOTALS
4	EAST	Purdy	Relfman	VA256	Children's	Virginia	5715	9100	380	4250	$19,445
5	EAST	Wells	Jane	VA255	Fiction	Virginia	18000	14500	15500	6950	$54,950
6	EAST	Greenburg	Linda	VA258	Non-Fiction	Virginia	17090	14100	14380	6750	$52,320
7	EAST	Squires	Fritz	VA254	Reference	Virginia	23600	24850	21535	15714	$85,699
8	EAST	Walters	Steve	VA257	Reference	Virginia	22700	24100	21070	15876	$83,746
9	NORTH	Blankens	Paul	NY348	Children's	New York	8445	10300	3740	4860	$27,336

Table Tools

When you have applied a table format, the **Table Tools** tab displays at the top of the Excel screen. Many table formatting options are available. You can, for instance, apply banded column or row formatting.

Filtering Data

Click any of the buttons in the field headings to set filter options. Select or deselect options to filter information as desired.



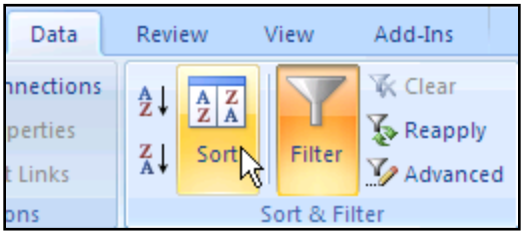
Set the desired filter and/or sort options and click **OK**.

Note: When a filter has been applied to a column, the filter button looks like this . When a Sort option has been applied to a column, the filter button looks like this .

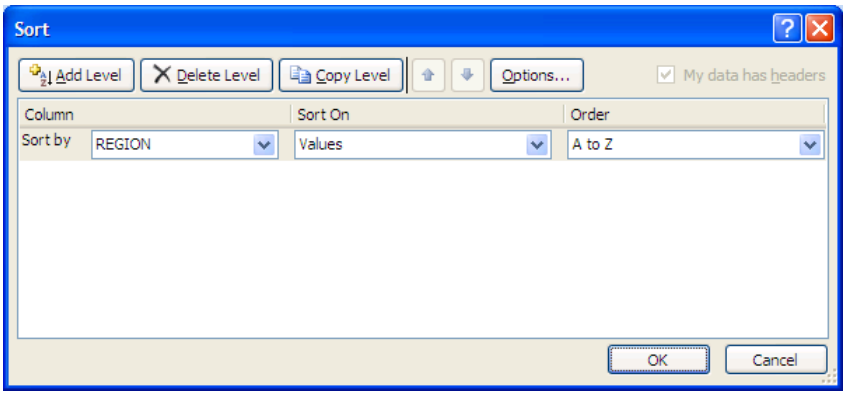
Sorting by More than One Column

Follow these steps to sort by more than one column.

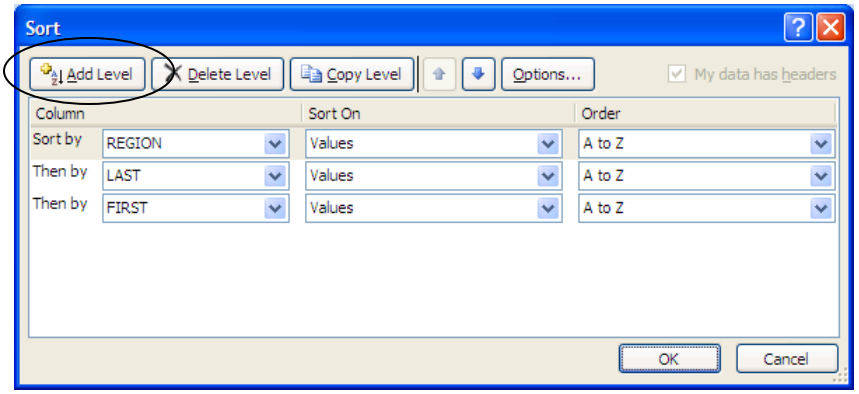
1. Click the **Data** tab; then select Sort.



The following dialog box displays.



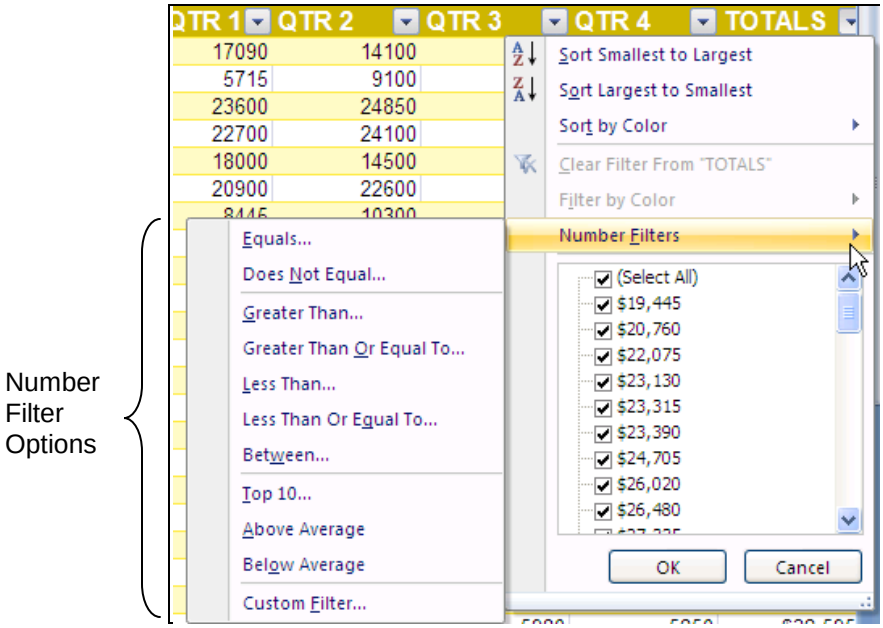
2. From the drop down box in the Column field, select the first column by which you want to sort, specify the Sort On, and Order options.
3. To add another column, click **Add Level**; specify the Sort On and Order options. To rearrange your selections, click the arrows  to modify the order in which your columns are sorted.



4. When finished, click **OK** to sort your data by your specifications.

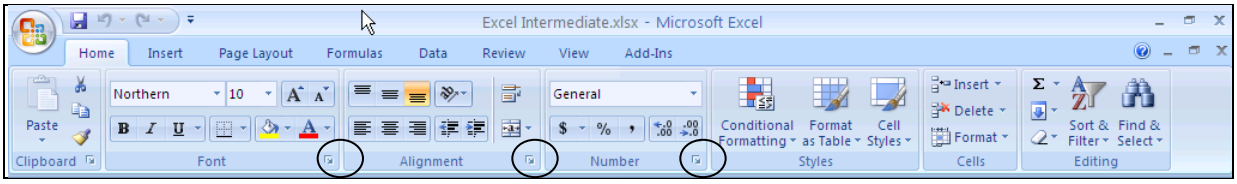
Number Filtering

When filtering columns containing numbers, additional filter options are available. Click the for the number column you want to filter and select Number Filters. Select the desired option.



Formatting

In addition to the Font and Number formatting that you can do from the **Home** tab of Excel, you can format worksheet protection, change alignment of cell content, and even apply conditional formatting. The conditional formatting options have been greatly expanded in Excel 2007.

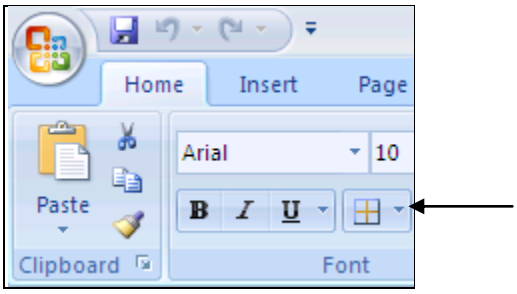


Familiar formatting options are available from the buttons on the ribbon of the **Home** tab. Rest your mouse on a button to display its purpose.

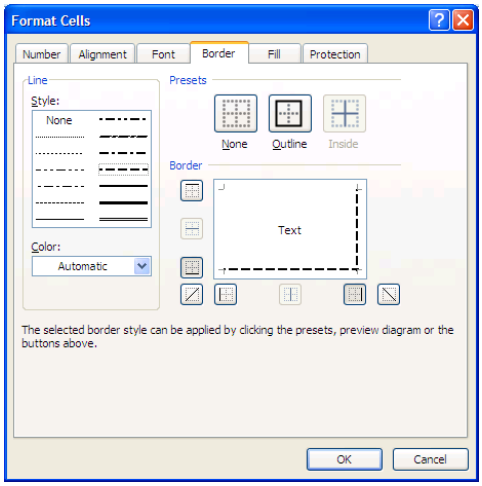
Additional options are available by clicking the from the Font, Alignment, or Number galleries. ‘

Formatting Borders

You can format borders using the buttons on the **Home** tab, or for additional options, click the dropdown arrow from the **Borders** button and select the desired options.



For additional options, click More Borders. The following dialog box displays.



1. In the **Line** area, select the appropriate Style and Color.

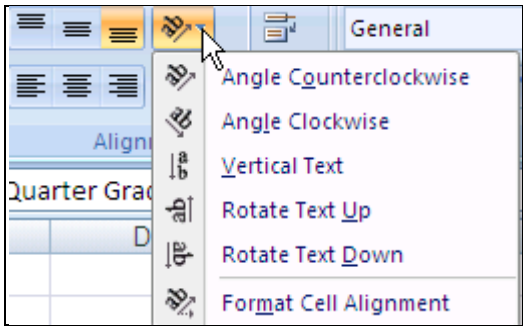
2. In the **Presets** area, select the appropriate option
   or
   In the **Border** area, indicate the type of border you want. Verify your selections in the display area of the dialog box.

3. Click **OK**.

Alignment Formatting

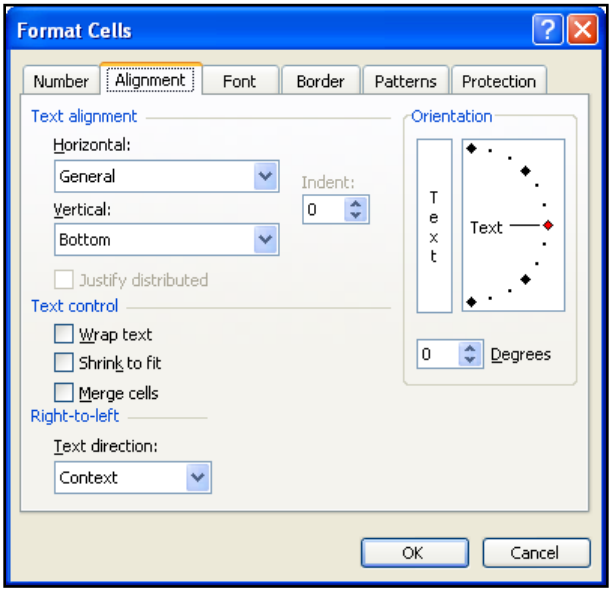
You can format the alignment of the cell contents. In addition to standard horizontal alignments, you can also align text at an angle or vertically. The horizontal alignment is initially set to General. This aligns text to the left, numbers and dates to the right. Follow these steps to change the alignment.

1. Select the cell(s) you want to format.
2. From the Alignment gallery of the **Home** tab, select the desired options.



or

For additional options, click the  in the Alignment gallery to open the **Format Cells** dialog box.

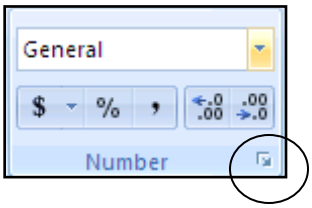


3. To change horizontal formatting, in the **Horizontal:** field, select the appropriate options.
   - To indent text that is left aligned, select **Left** (Indent) from the drop down list. Then increase the number in the **Indent:** field. For each number increase, the text moves by how many Xs using the current font could fit in the cell to the left of the entry.
   - To fill a cell with a pattern of characters across the width of a cell (e.g. all x's) select **Fill**.
   - To center text across several cells, first select the cell you want to center and all other cells in this row over which you want the text centered. Then select **Center Across Selection**.
4. To change the orientation or angle of the text, in the **Orientation** area, click and drag the red diamond ◆ to the desired degree of angle.
   or
   Click to display the text vertically (one letter underneath the other).
5. To change the vertical alignment (where the text displays vertically within the cell height), in the **Vertical:** field, select the appropriate option.
6. To change text control, select the appropriate option.
   - Wrap text displays text on several rows in the cell while leaving the column width the same.
   - Shrink to fit makes the font size smaller to fit in the cell (not usually recommended).
   - Merge cells merges the contents of one cell over several selected cells.
7. When finished selecting the appropriate options, click **OK**.

Special and Custom Number Formats

Special Formats

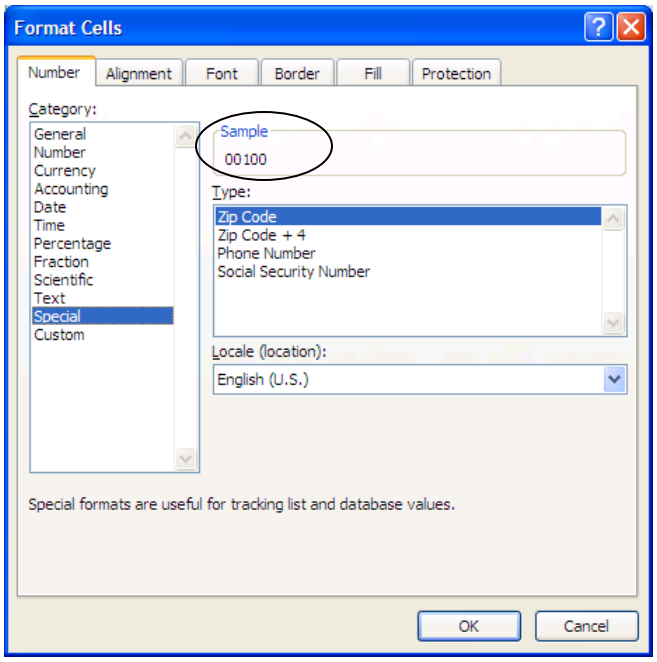
Excel has special formats for such things as Social Security numbers, phone numbers, and zip codes. These formats only require that you enter the digits – no punctuation is required. Excel will display the numbers with punctuation in your cells.



Accessing the Number Format Options

You can access the dialog box below from the button in the Number gallery.
OR
Right-click a cell and select Format Cells.

Select options from the Special category.



Custom Format Example – Rounding Millions

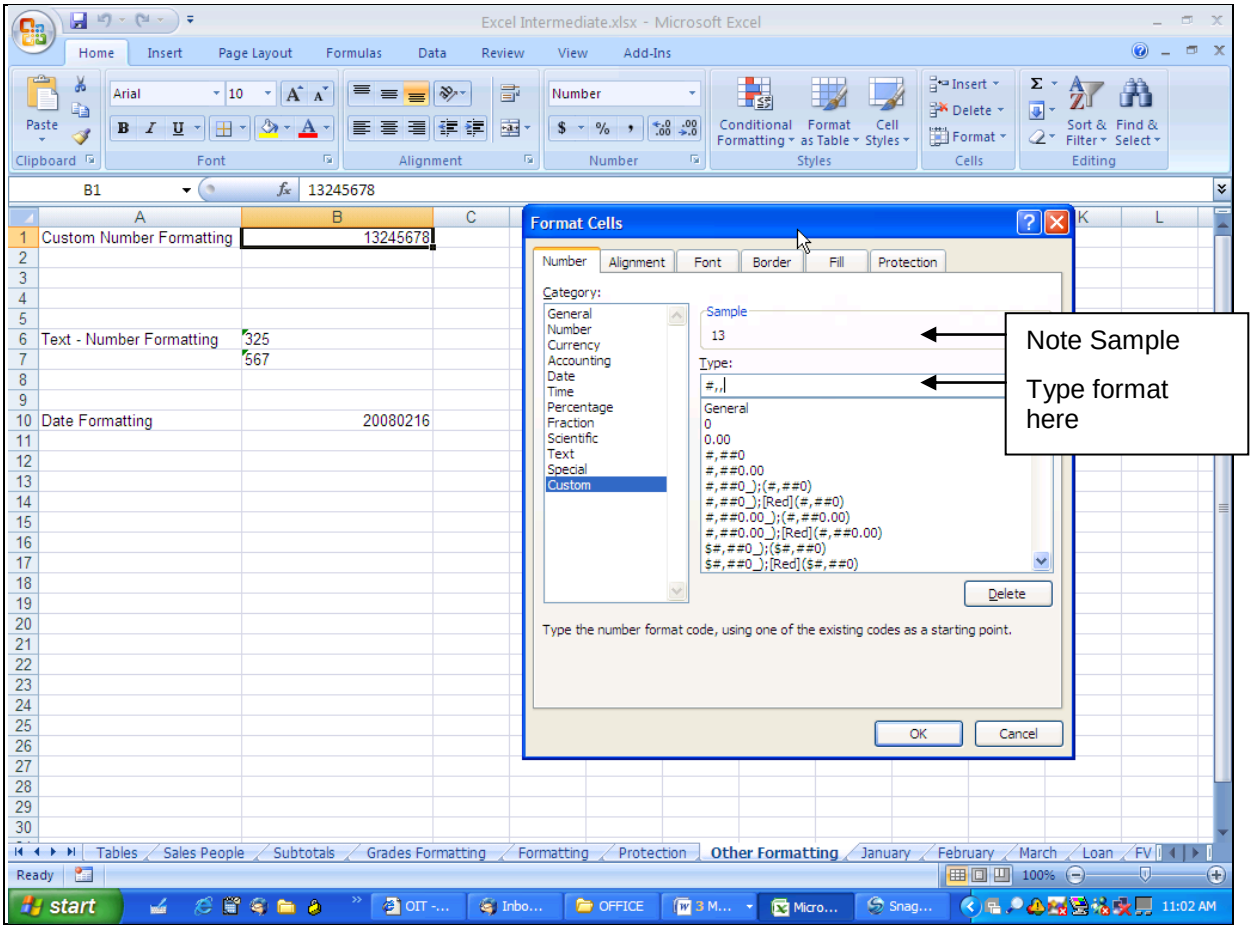
In the following example, cell B1 has a 7 digit number that you might want to format without the thousands and hundreds. One comma at the end of the format is used to display it in thousands. Two commas tell Excel to round to the nearest million, etc. To create a custom format, you can type your format as described below. Consult Help for other custom formats.

When doing custom formatting, always view the Sample area to see how your number will display.

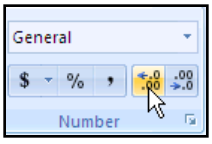
1. Access the Format Cells dialog box as described above.
2. Scroll down to Custom (left side).

3. In the **Type** field, enter the custom format as shown; then click **OK**.

   - To round to thousands (remove hundreds from the display in the cell), type **#,#,** (one comma at the end of each grouping).
   - To round to millions (remove hundreds and thousands from the display in the cell), type **#,,** (two commas at the end to remove two groupings).



If desired, you can then use the **Increase Decimal** button from the **Home** tab to display the information as 13.2 or 13.25 (million) for this example.



Other Numerical Formatting Options

Sometimes imported data displays in an undesirable format. For instance, a date may display as 20080516, for May 16, 2008. From the **Data** tab, select Text to Columns. Click Next, until you get to Step 3 of the Wizard. Select the desired format. (Example: YMD)

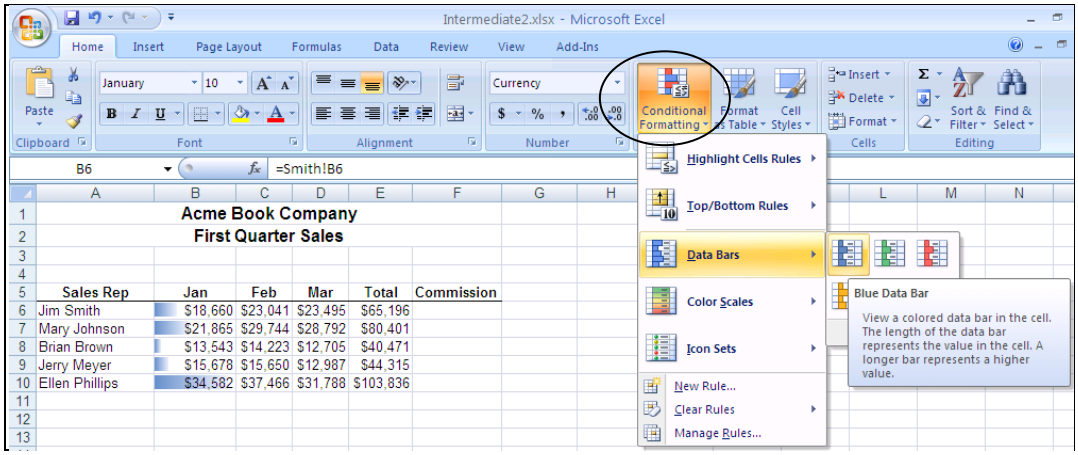
Note: You can use Text to Columns to also correct numbers entered as text.

Conditional Formatting

Excel 2007 has advanced features allowing you to format a data range quickly to see trends or highlight important information.

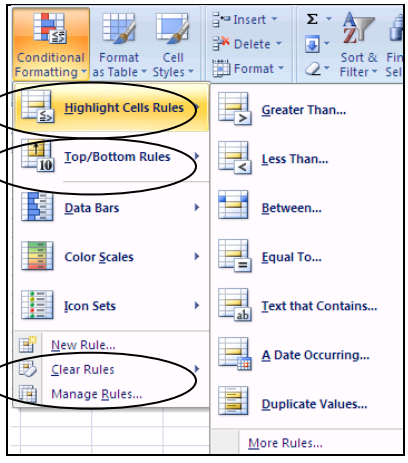
1. Select a range of numerical data.
2. From the **Home** tab of Excel, click **Conditional Formatting**.

   The Live preview feature allows you to see how your data will display, based upon your selection. Many pre-defined options are available.
3. Select the desired option to apply the formatting. The example below shows the Blue Data bar format applied to the "Jan" data. This is similar to a chart view. Many other options are available.



Customizing Conditions

To customize the conditions by which data are evaluated, set option rules using one of the selections circled below.



Removing Conditional Formats

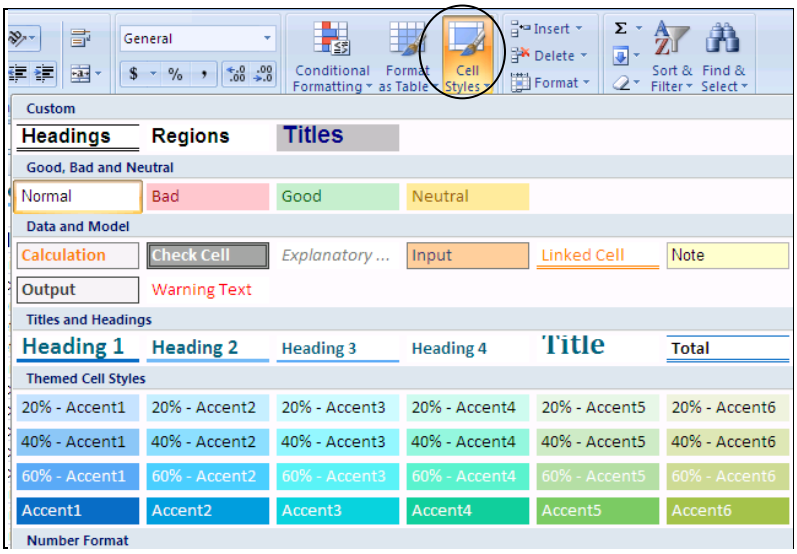
To remove conditional formatting, select the desired cells; then click the **Clear** button  and select Clear Formats.

Using Excel Styles for Formatting

Excel also has styles that can be applied to your file.

Applying an Excel Cell Style

Select the cells you want to format; then from the **Home** tab, select the **Cell Styles** button to display a list of styles. Select the desired option.



Using the Format Painter

A great way to copy formatting from one location is by using the **Format Painter** button from the **Home** tab of the ribbon.

1. Select the cell(s) that have the format you want to copy.
2. Click the **Format Painter** button from the **Home** tab.
3. Click and drag over the cells to which you want to copy the formatting.

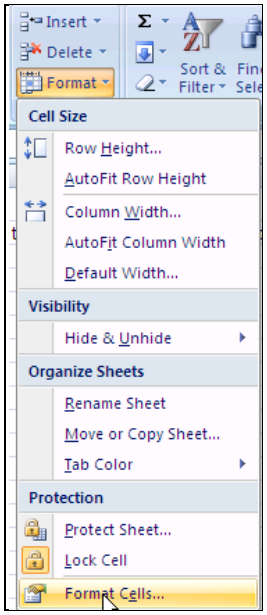
Note: To use the Format Painter for multiple locations in the worksheet, double-click the **Format Painter** button. Click and drag over the cells you want to format. To deactivate the Format Painter, click the button again or press your **Esc** key.

Protecting a Worksheet - Formatting Protection

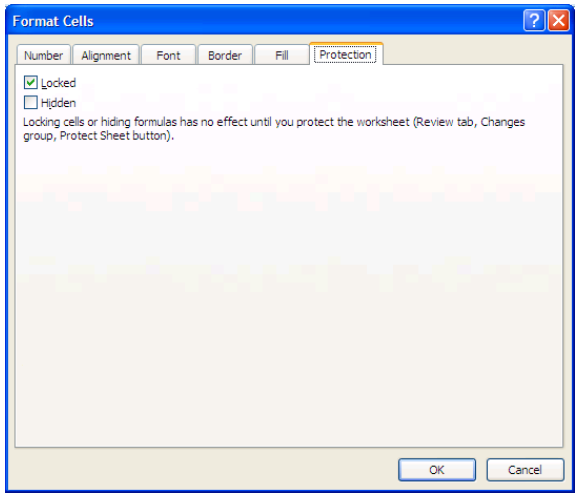
Use the Protection option to prevent valuable formulas or other data from being overwritten. If an entire workbook is protected, no one is able to enter any data. If you want others to be able to add or edit information in specific cells or ranges, when protecting a worksheet, you must select all cells where data should be unprotected, and “unlock” protection on those cells. Follow these steps to protect “selected” cells of a worksheet.

1. Select the cells you do NOT want to protect.

2. From the **Home** tab, in the Cells gallery, click Format; then click Format Cells.



3. If necessary, activate the **Protection** tab.

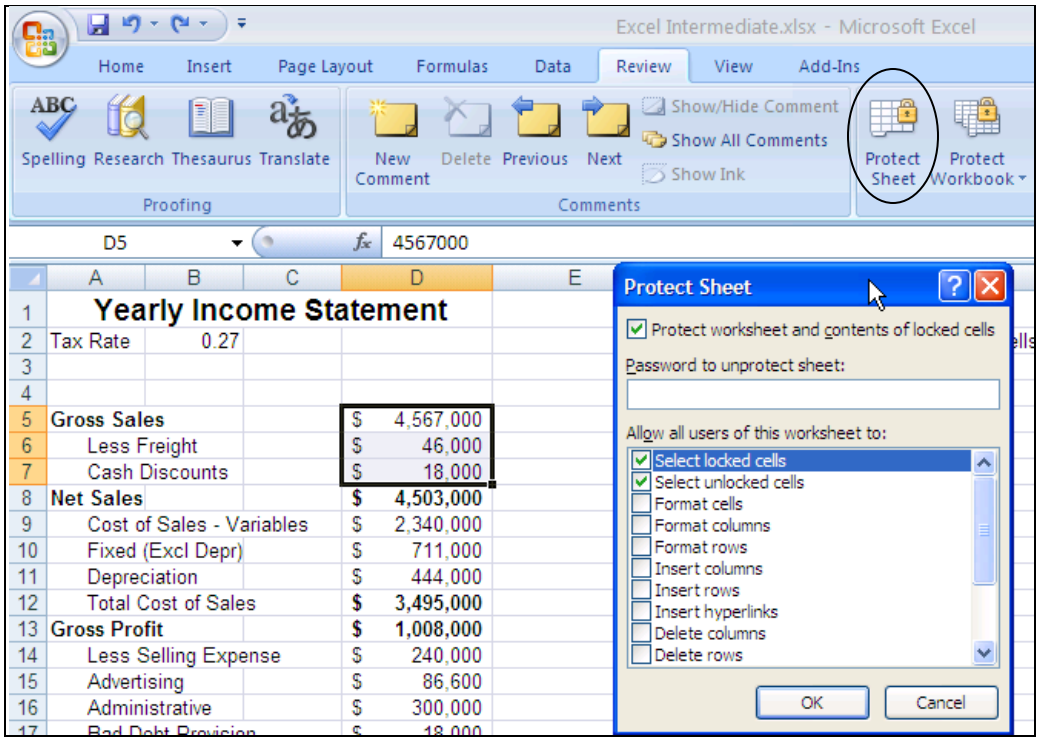


4. De-select **Locked** to indicate that the selected cells can be changed. All cells not currently selected cannot be changed once the sheet is protected.

Note: You can also hide formulas. You can use the "Hidden" option for this purpose. Users will only see the value displayed in the cell–the formula will not display on the Formula bar when the cell is selected.

5. Click **OK**.

6. To protect the worksheet, select the **Review** tab, then select Protect Sheet.



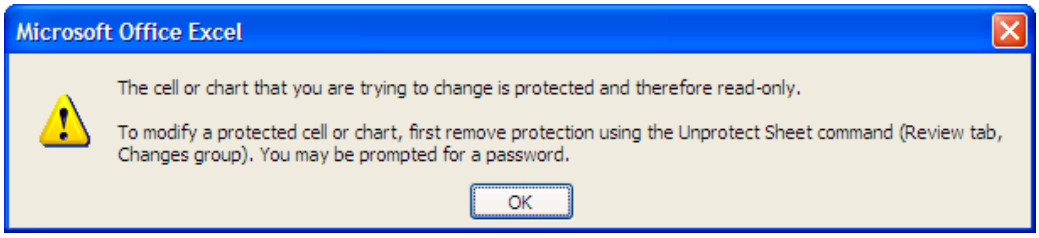
7. In the ***Protect Sheet*** dialog box, verify that the desired options are selected.

8. If desired, enter a password. Please be aware that the password will be required for all users, so use this option with discretion.

9. Click **OK**.

Making Changes to a Protected Worksheet

You can make changes to any unlocked cells. However, if you try to change a locked cell, the following prompt displays.



Click **OK** to return to the workbook.

Unprotecting a Worksheet

If you need to make changes to the locked cells, follow these steps.

1. Select the **Review** tab, and select **Unprotect Sheet**.
2. If prompted, enter a password, then click **OK**.

Other Formatting Tips

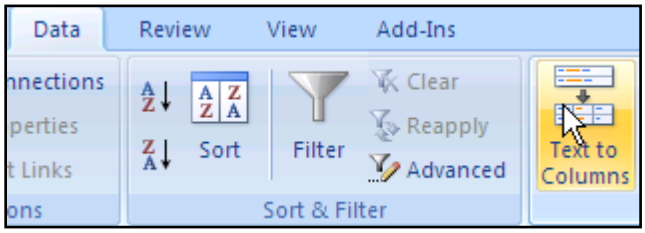
Numbers as Text

To enter numbers as text, e.g., part numbers that will not be calculated, account numbers, invoice numbers, etc., type an apostrophe before the number. ’22 displays left aligned and would not be used in calculations. The apostrophe only displays in the Formula bar – not in the worksheet. Excel now displays green triangle in the upper-left corner of the cell to alert you of a potential formatting problem. Selecting the cell displays a button to assist you in the changing the format, if necessary. You can click the button to change to numbers if desired.

Note: Imported numerical data sometimes displays as text, when the desired format is numbers. To change it to number format, use the button above. The number formatting options won’t change it.

Other Numerical Formatting Options

Sometimes imported data displays in an undesirable format. For instance, a date may display as 20080516, for May 16, 2008. From the **Data** tab, selecting, Text to Columns option may provide a solution.



Click Next, until you get to Step 3 of the Wizard. Select the desired format. (Example: YMD)

Entering Fractions

If you want to enter fractions when typing, you must type a zero, then a space, then the fraction, e.g., 0 3/5. Otherwise 3/5 converts to a date and displays as 5-Mar.

Note: You can also format cells as fractions (PRIOR to entering data) to allow fractions to display correctly.

Formatting Multiple Worksheets

You can format multiple worksheets to have the same formatting and content. Ungroup sheets to enter content specific for each worksheet.

1. Select the worksheets that you want to be the same. (Hold down the **Ctrl** key and single click all the appropriate worksheet tabs.)

2. Enter all data and apply all formatting, that you want to display on all the selected worksheets. Each sheet will display the identical data and formatting.

Tip: Group worksheets before creating Headers and/or Footers in large workbooks.

Adding Data Specific for Each Worksheet

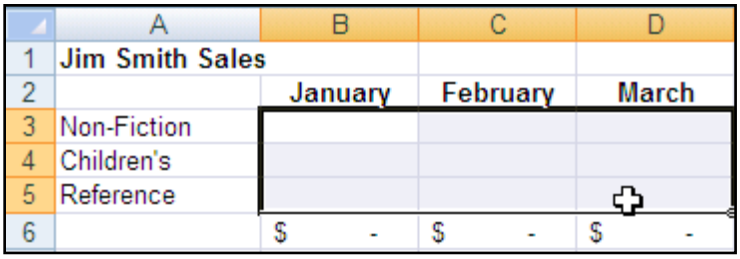
When you are ready to add the data specific for each sheet, be sure to ungroup the worksheets. To ungroup the worksheets, right-click one of the selected worksheet tabs, then select Ungroup Sheets.

Worksheet Tab Colors

With Excel 2007 you can now format worksheet tabs. This is useful for organizing worksheets containing related content, similar to the way in which colored file folders are used when working with paper files. To apply a color, right-click the worksheet tab, and select Tab Color. Select the desired color, and click **OK**.

Quick Data Entry

You can highlight the cells where you want to enter data to quickly and easily move from cell to cell.



	A	B	C	D
1	Jim Smith Sales			
2		January	February	March
3	Non-Fiction			
4	Children's			
5	Reference			
6		$ -	$ -	$ -

Highlight the cells where you want to enter data. Begin typing the data. Each time you press **Enter**, the cursor moves to the next cell (down one cell until that column in the highlighted area is filled, then to the top highlighted cell in the next column. This allows efficient use of the number keypad.

Note: You can also use the **Tab** key to move left to right within the selected area, then down to the next row.

Note: To move back one cell press **Shift** + **Enter**, or **Shift** + **Tab**.

Tip: While the cells are still highlighted, apply the desired number formatting.

Financial Functions

Excel has over 300 functions available. These functions perform math, text, logical, and other types of calculations. In the Introduction to Excel class we explored some statistical functions. We will explore some financial and logical functions in this class.

Excel's Financial Terminology

When you use the Insert Function Wizard, the following terms are described briefly in the dialog box. A more complete description is provided below.

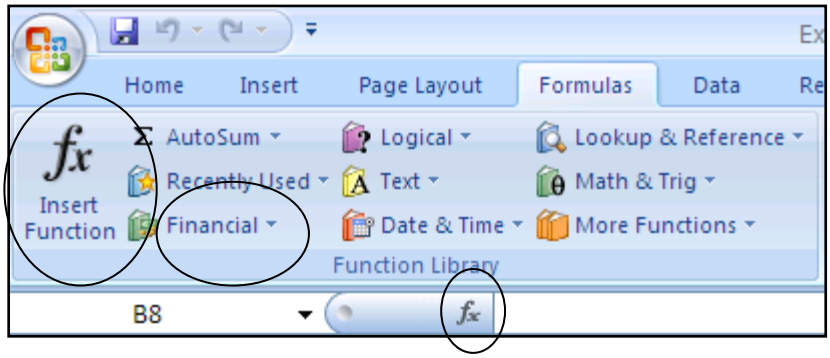
Present Value (PV)	The "principal" amount. For example, when you invest $1000 in a CD, this amount is the principal. However, if you borrow $5,000, this amount is the principal or present value of the loan.
Future Value (FV)	Principal amount plus the interest. If you invest $1,000 for three years and earn 7% interest, you receive $1,225.04 at the end of the three-year term. This is the future value of your investment. However, if you borrow money, the total amount you repay (the principal and interest) is the future value.
Payment (PMT)	Can be principal or principal plus interest. If you deposit $100 a month into a savings account, $100 is the payment. If you have a monthly mortgage payment of $950, the $950 is comprised of both principal and interest.
Interest Rate (Rate)	Percentage of the principal, usually expressed on an annual basis. It may be necessary to divide by months or quarters to get a correct result.
Period	Represents when the interest is paid or earned. A bank CD may pay interest quarterly; a car loan may require monthly interest payments.
Term	Amount of time of interest.
NPER	Number of payment periods.

PMT Function

You can have Excel calculate payments, as well as interest, and principle.

1. Select the cell where you want to display the result of the function.

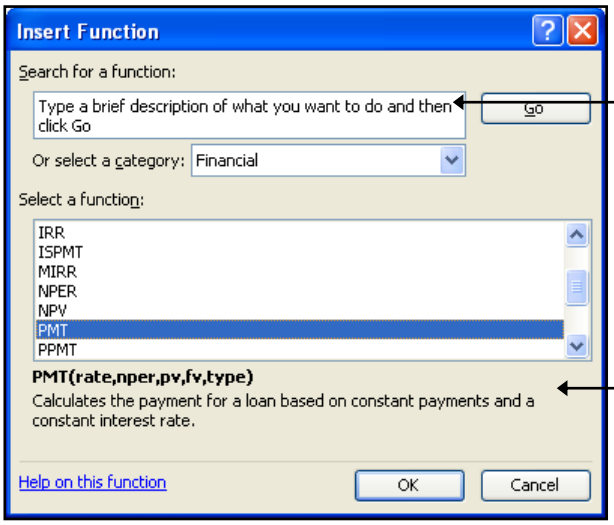
2. Click the **Insert Function** button (from the **Formulas** tab OR from the Formula bar.



or

For Financial Functions, click Financial from the **Formula** tab to display a list of Financial Functions.

3. From the *Select a function:* field, select the appropriate function. For the Payment function, select Financial, then select PMT.



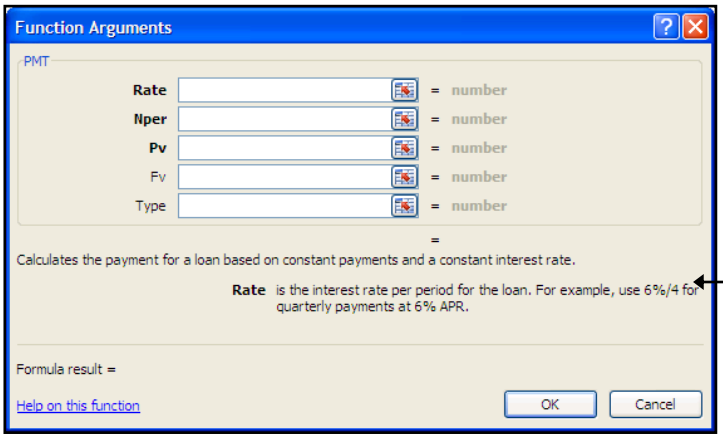
You can also type search text and click Go to locate a function.

Description of selected function

- To calculate payments, select PMT
- To calculate interest, select IPMT
- To calculate principle, select PPMT

Note: If you enter the PMT function manually, it will display as follows: =PMT(rate,nper,pv,fv,type)

4. Click **OK** to close the dialog box. The **Formula Arguments** palette displays. The example below is for the PMT function.

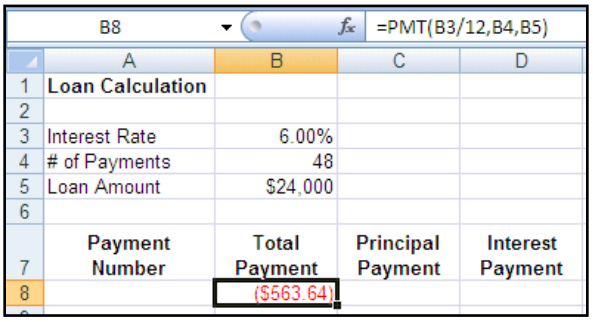


5. Complete the **Formula Arguments** palette by typing the appropriate information or clicking the appropriate cells with the mouse.

   Hint: You can drag the Formula Pallet out of your way or click the **Collapse** button to collapse the dialog box and select the appropriate cells. If you clicked , press **Enter** to return to the Function Arguments dialog box.

Argument:	Description:
Rate	The interest rate per period for the loan. If this is an annual interest rate, divide by 12 (/12) to calculate monthly payments.
Nper	Total number of payments
Pv	Present value of the loan (how much money is being borrowed)
Fv	Future value of the loan – usually 0. (how much money is owed at the end of the loan)
Type	Payments are due at the beginning (1) or the end (0) of the payment period.

6. Click **OK** to close the **Function Arguments** palette and display the result. Payment results always display as a negative number. See page 22 for more information.



Using this example, you can change the interest rate, the loan amount, or the number of payments to calculate the payment based upon those variables.

IPMT & PPMT

Calculate principle (PPMT) and interest (IPMT) using the above procedures. IPMT and PPMT require entry in another field: the "Per" field (for what payment do you want to know the principle or interest payment).

Challenge: You can copy the IPMT function to create an amortization schedule using these functions. This requires using Absolute values. Absolute cell references are covered in the Introduction to Excel class. A brief description is provided below.

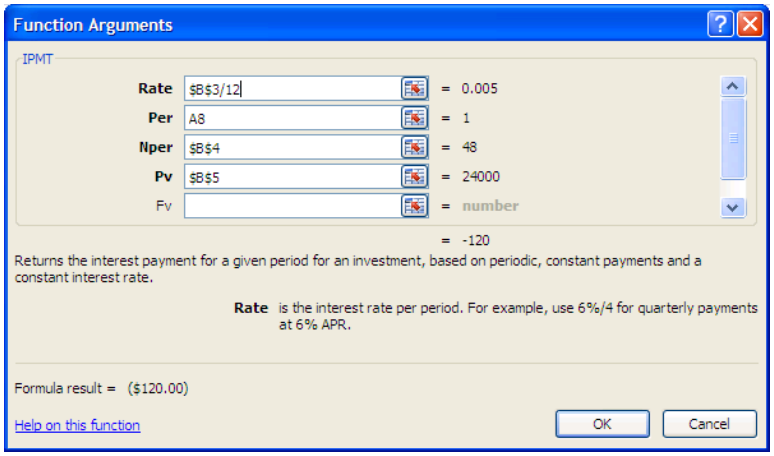
Absolute and Relative Cell References

By default, when you copy a formula, it calculates relative to its new location. To prevent references from adjusting relative to their new location, you can write the formula using absolute references to force copied formulas to always use specific cells for some of the cells in the formula.

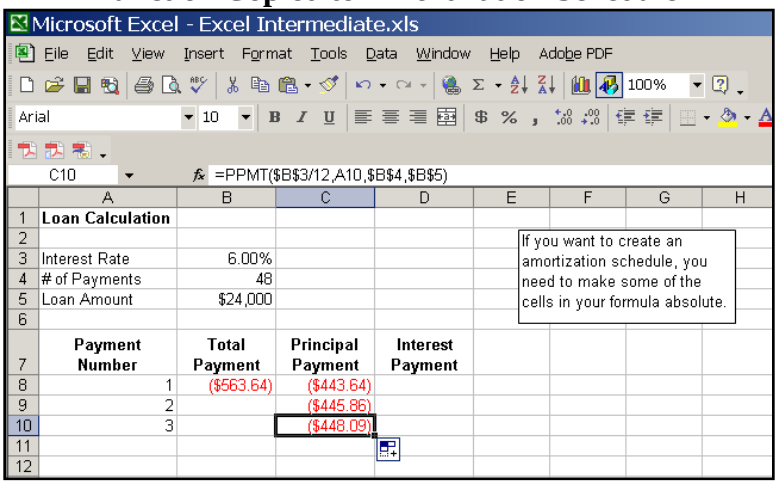
Absolute References

To make a cell reference absolute, type a $ before the column and row references to "lock in" the row and column. Example: B3

Note: An easy way to make the cell reference absolute is to position the cursor in the cell reference in the Formula bar, then press **F4**, then press **Enter**.



IPMT Function Copied to Amortization Schedule



Negative or Positive Perspective

Determine the perspective of the owner of the cash flows. Are you a depositor or the bank? Are you the borrower or the lender? Generally money that comes to you is signed positive. Money that goes away from you is signed negative. So a loan payment you make would be negative. Interest you receive on an investment would be positive. It may be necessary to enter some values of your function as negative numbers to achieve the correct result.

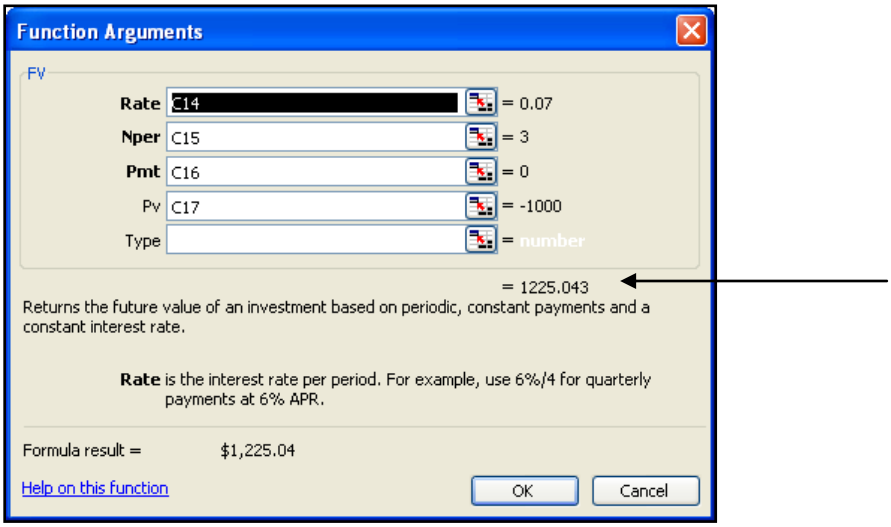
Rate	7%
Nper	3
PMT	0
PV	($1,000.00)
Type	0

If you paid out $1,000 for this investment, enter as a negative number.

FV – Future Value

Use the future value function to calculate the return on an investment based on periodic, constant payments and a constant interest rate. For instance, you might want to calculate how much $1,000 will accumulate to at 7% after 3 years.

1. Select the cell where you want to display the result of the function.
2. Click the **Insert Function** button on the Formula bar.
3. From the *Select a function:* field, select the appropriate function. For the Future Value function, select Financial, then select FV.
4. Complete the **Formula Arguments** palette by typing the appropriate information or selecting the appropriate cells with the mouse.



5. Click **OK** to close the **Function Arguments** palette and display the result.

Rate

If you want to determine the rate of growth for an investment, use the Rate function. For instance, you invested $1,000 which has accumulated to $2,000 in 8 years. What was the annual growth rate? An example of data is below.

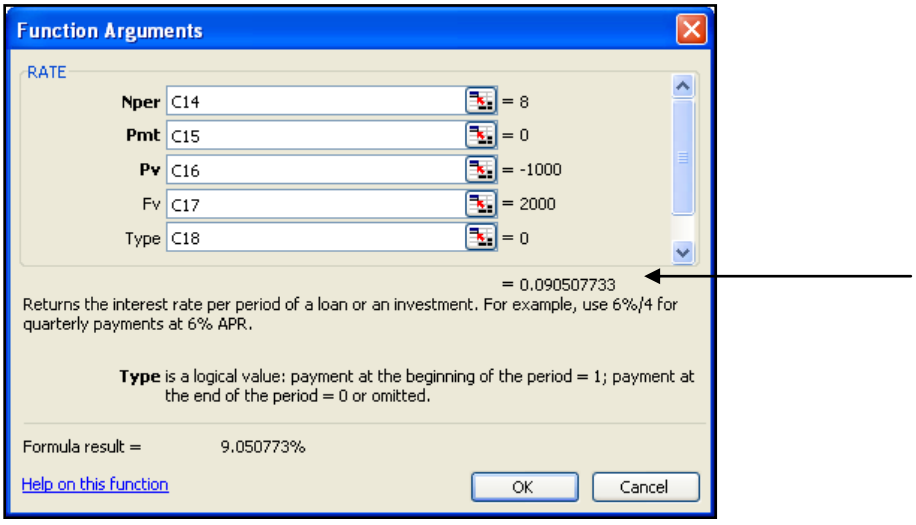
Nper	8
PMT	0
PV	($1,000.00)
FV	$2,000.00
Type	0

1. Select the cell where you want to display the result of the function.

2. Click the **Insert Function** button on the Formula bar.

3. From the *Select a function:* field, select the appropriate function. For the rate function, select Financial, then select Rate.

4. Complete the **Formula Arguments** palette by typing the appropriate information or selecting the appropriate cells with the mouse.



5. Click **OK** to close the **Function Arguments** palette and display the result.

NPER

If you want to determine how long it will take to achieve a financial goal based upon a constant interest rate, use the NPER function. For example, if you deposit $100,000 and can earn 14% per annum, how long will it take to become a millionaire? An example of data is below.

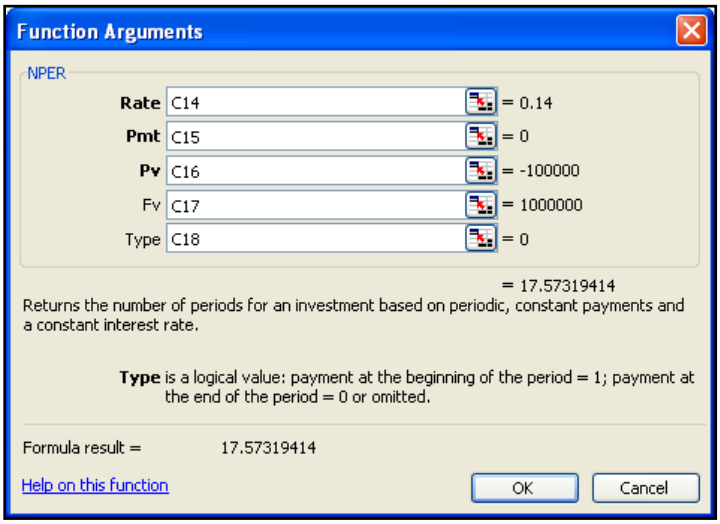
Rate	14%
PMT	0
PV	($100,000.00)
FV	$1,000,000.00
Type	0

1. Select the cell where you want to display the result of the function.

2. Click the **Insert Function** button on the Formula bar.

3. From the *Select a function:* field, select the appropriate function. For the NPER function, select Financial, then select NPER.

4. Complete the **Formula Arguments** palette by typing the appropriate information or selecting the appropriate cells with the mouse.



5. Click **OK** to close the **Function Arguments** palette and display the result.

Using Logical Functions – IF Statements

When you use logical functions, you evaluate various conditions to make decisions on whether the result of the evaluation is true or false. You can, for example, create a logical IF statement to evaluate whether a salesperson has attained their yearly sales quota. You can also create a nested If statement to determine the appropriate commission based upon their sales.

If you enter the function manually, the proper syntax for an IF statement is:
=IF(Logical_text,Value_if_true,Value_if_false)

You can also use the Insert Function option to complete an IF statement. We will use this procedure in this class.

Logical Test

The logical test contains a mathematical expression to analyze how one value relates to another. An example would be: B6>C6. That condition can be evaluated as either true or false.

Value if True

When the result of the logical test is true, then the next portion of the equation (the Value if true function) executes. This function can calculate a formula, display text, such as *Increase* or *Decrease*, display a value, or display contents of a cell.

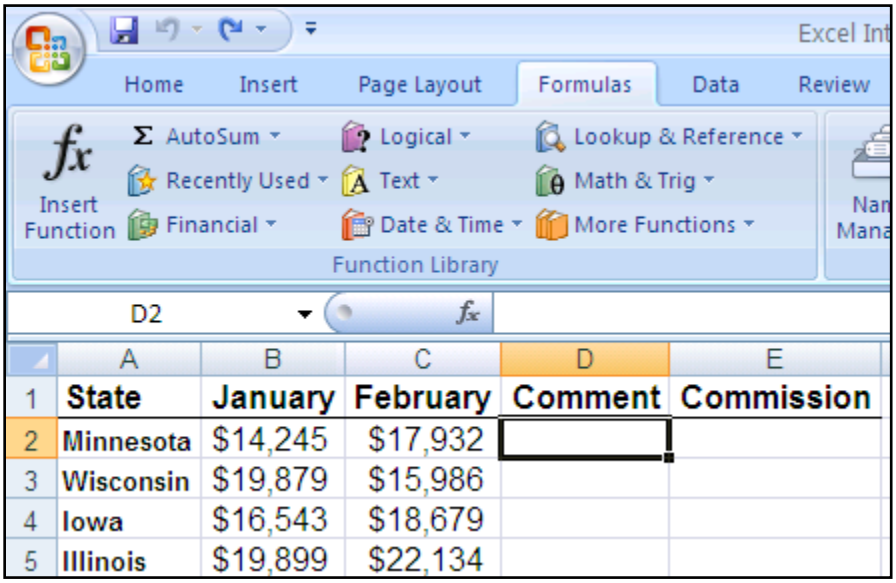
Value if False

If the result of the logical test is false, then Excel can perform the same calculations as listed above.

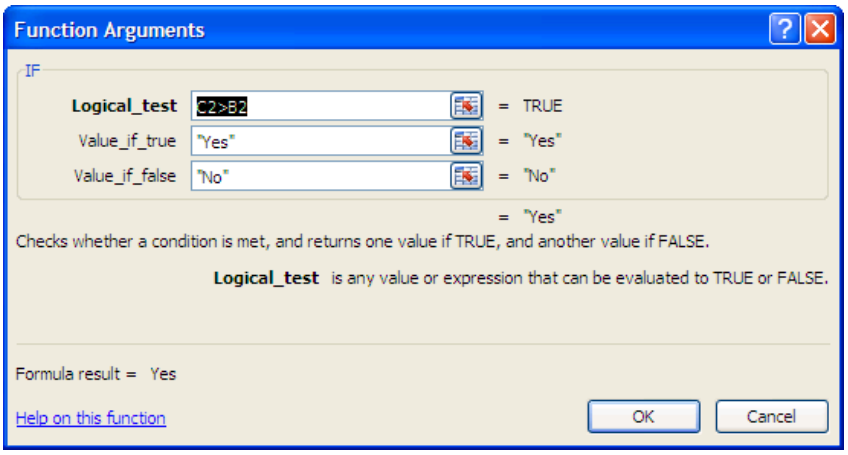
Creating a Simple IF Statement

We will begin by creating a simple IF statement to see how the Function Wizard helps us to assemble the information.

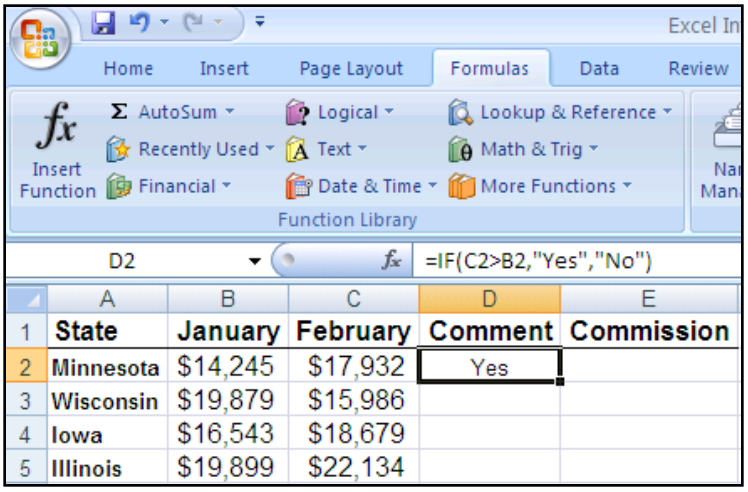
1. Select the cell where you want the result to display.



2. Click **Insert Function** button on the Formula bar.
3. From the *Select a function:* field, type "IF" in the search bar or select the Logical category, and the IF function. You can also click the Logical category from the **Formulas** tab and select IF.
4. Click **OK**. The **IF *Function Arguments*** dialog box displays.



5. In the **Logical_test** field, enter the value you want to test (e.g., C2>B2).
6. In the **Value_if_true** field, type the value, word, or cell reference you want to display if the logical test is true (e.g., Yes).
7. In the **Value_if_false** field, type the value, word, or cell reference you want to display if the logical test is false (e.g., No).
8. Click **OK** to display the appropriate value in the cell. If appropriate, drag the fill handle to copy the formula to adjacent cells.



Creating a Nested IF Statement

If you need to evaluate the information in a more complex manner, you can create a nested IF statement. For example, there might be different commission rates awarded, depending upon the sales volume.

A nested IF statement places one IF statement within another. Up to 64 IF statements can be nested using Excel 2007. Previous versions allowed 7 nested conditions.

To calculate different commissions using a nested IF statement, you might have the following criteria.

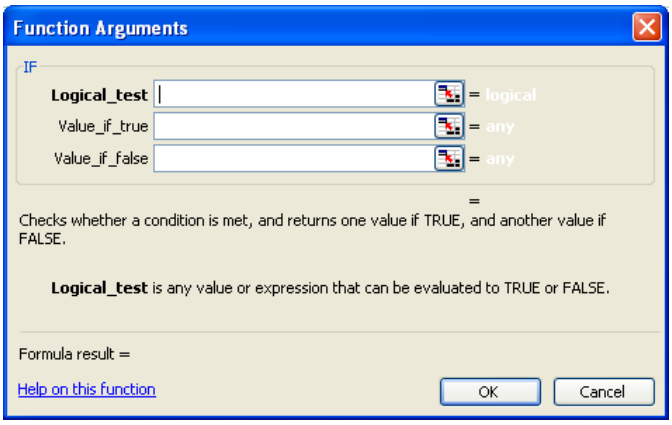
- If sales are less than $50,000, the sales person receives a commission of 3%.
- If sales are greater than $100,000, the sales person receives a commission of 10%.
- If sales are more than $50,000, but less than $100,000, the sales person receives a commission of 7%.

Use the following procedure to create a nested IF statement.

1. Select the cell where you want to display the result of the formula.

	A	B	C	D	E	F	G
1	Acme Book Company						
2	First Quarter Sales						
3							
4							
5	**Sales Rep**	**Jan**	**Feb**	**Mar**	**Total**	**Commission**	
6	Jim Smith	$19,988	$27,769	$24,354	$72,111		
7	Mary Johnson	$21,865	$29,744	$28,792	$80,401		
8	Brian Brown	$13,543	$14,223	$12,705	$40,471		
9	Jerry Meyer	$15,678	$15,650	$12,987	$44,315		
10	Ellen Phillips	$34,582	$37,466	$31,788	$103,836		
11							

2. Click the **Insert Function** button  on the Formula bar.)
3. From the *Select a function:* field, select the appropriate function. (Select the Logical category, and the IF function.)
4. Click **OK**. The **IF *Function Arguments*** dialog box displays.

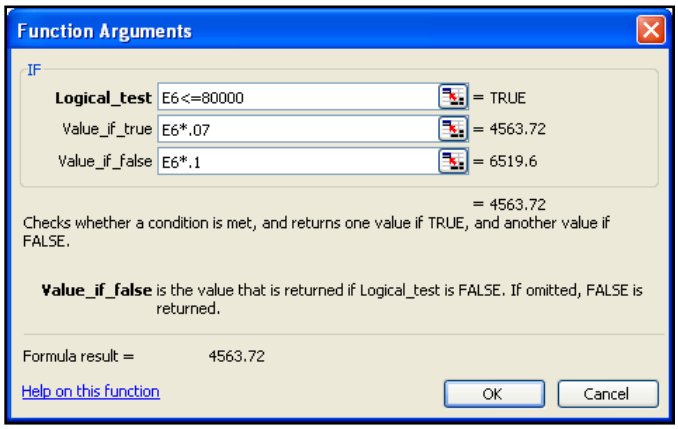


5. In the **Logical_test** field, enter the value you want to test (e.g., E6<50000).

   Note: Do NOT use commas or $ when entering the numbers in a logical IF statement.

6. In the **Value_if_true** field, type the value, word, or cell reference you want to display if the logical test is true (e.g., E6*3%).
7. In the *Value_if_false* field, type the formula, value, or text you want to execute or display if the logical test is false. In this example, this is the portion that would contain the nested IF statement (e.g., for sales less than $50,000). To create the nested IF statement,
   - Click 

from the left side of the Formula bar. A new IF function box displays and IF( ) displays in the Value_if_false position on the formula bar.
   - In the **Logical_test** field, enter the expression you want to test (e.g., E6<=80000).
   - In the **Value_if_true** field, type the formula, value, or text you want to execute or display if the logical test is false (e.g. E6*7%). See the example below.
   - In the **Value_if_false** field, type the formula, value or text you want to execute or display if the logical test is true (e.g., E6*10%).



8. Click **OK** to display the appropriate value in the cell.

   For this example the entire formula would display as follows:
   =IF(E6<50000,E6*0.03,IF(E6<=80000,E6*0.07,E6*0.1))
9. If appropriate, use the fill handle to copy the formula to adjacent cells.

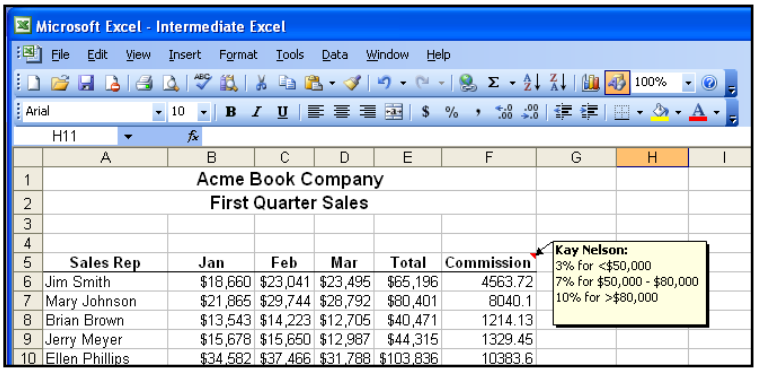
Working with Comments

You can add comments to cells in a workbook to help explain information for yourself or for others using the workbook. The comments can be printed on the worksheet, at the end of the worksheet, or they can just be viewed on line.

Adding Comments

Follow these steps to add comments to a worksheet.

1. Right-click in the cell where you want to insert a comment, and select **Insert Comment**. A text box displays with an arrow pointing to the cell upon which you are commenting.
2. Type your comment in the box provided.



3. Click outside the comment box to deselect it.

Viewing Comments

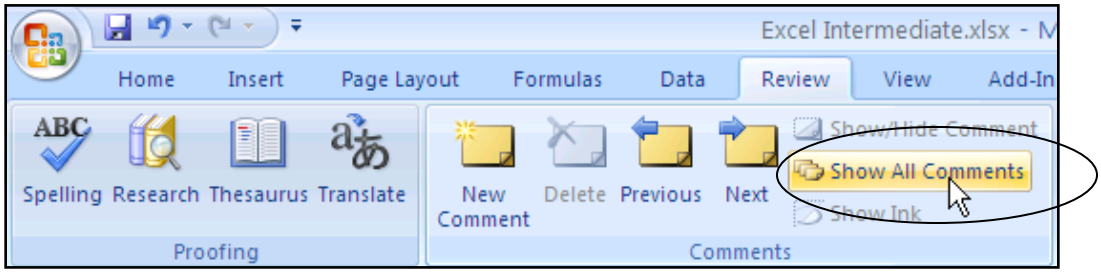
By default, when you insert a comment on a worksheet, only the comment indicator displays in the upper right corner of the cell – not the comment. To view a comment, rest your mouse over the cell displaying the comment indicator.

Displaying an Individual Comment

1. Right-click on the cell containing the comment indicator.
2. Select Show / Hide Comment.

Displaying or Hiding All Comments on a Worksheet

Select the **Review** tab; then select Show All Comments, to toggle between viewing and hiding all comments. This is especially useful if working with a large worksheet containing many comments. If desired, click **Previous** or **Next** to navigate from comment to comment.



Moving a Comment Box

If you display a comment, you can click and drag it to a more appropriate location.

1. Click once on the comment box to display a "fuzzy" border around the box.
2. Click and drag the border to move the box to the appropriate location.

Hiding an Individual Comment

1. Right-click on the cell containing the comment indicator.
2. Select Hide Comment.

Editing a Comment

1. Right-click on the cell containing the comment indicator.
2. Select Edit Comment.
3. Make the appropriate changes.
4. Click outside the comment box.

Deleting a Comment

1. Right-click on the cell containing the comment indicator.
2. Select Delete Comment.

Changing the Comment Identifier Name

You can change the name that displays when using a comment.

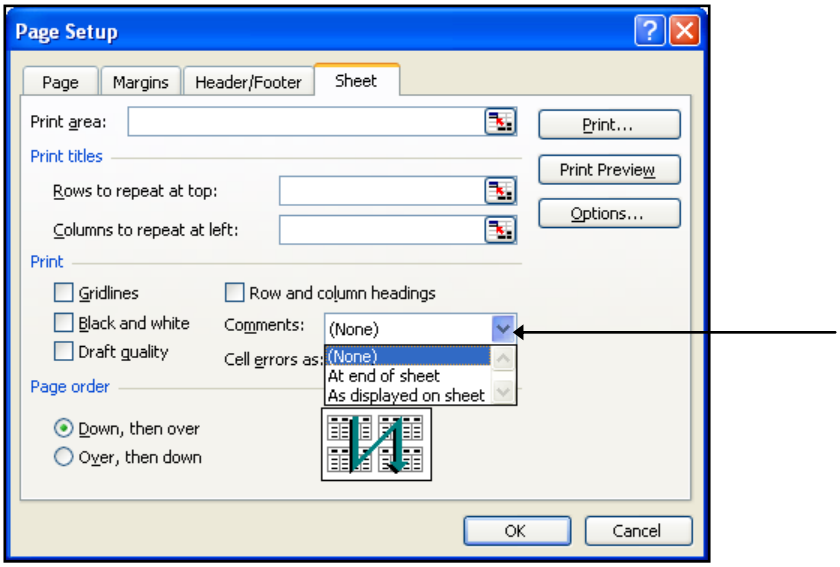
1. Click the **Microsoft Office** button  in the upper-left corner of the Excel screen.
2. Select Excel Options; then click **Popular**.
3. In the **User name:** field, at the bottom of the dialog box, enter your name.
4. Click **OK**.

Note: You can also change the name in an individual comment box.

Printing Comments

By default, cell comments and comment indicators don't print when you print a worksheet. Use the following steps to print comments.

1. From the **Page Layout** tab, click the button from the Page Setup gallery. The ***Page Setup*** dialog box displays.
2. Activate the **Sheet** tab.

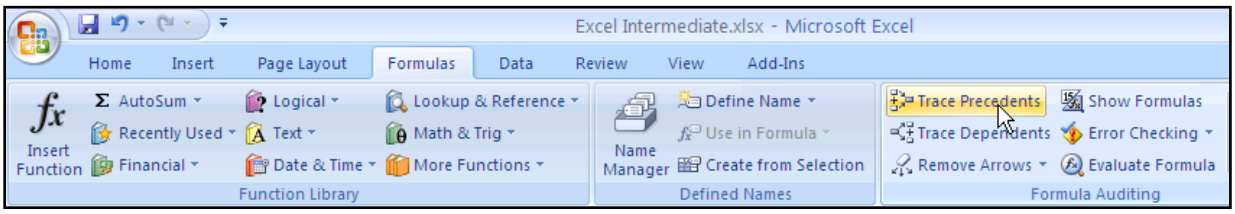


3. In the **Comments**: area, select the appropriate option.
   - If you select **At end of the sheet**, all comments print on a separate sheet. The printed page contains cell references to indicate to which cells the comments refer.
   - If you select **As displayed on sheet**, first display the comments, then print.
4. If desired, click the **Print Preview** button.
5. Click **Print**.
6. Click **OK** to close the ***Page Setup*** dialog box.

Auditing Formulas

You can use Excel's auditing tools to evaluate your formulas.

The auditing options are available from the **Formulas** tab.



Precedents and Dependents

Precedents are the cells referred to by the formula in a given cell. They are the cells upon which the data displayed from a formula in a given cell is based.

Dependents are the cells that contain formulas that refer to a given cell. They are based upon the data in the given cell.

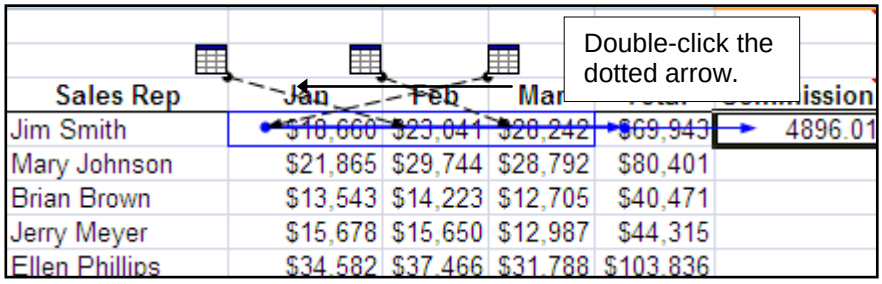
Click in the cell you want to audit; then click **Trace Precedents** or **Trace Dependents** to display arrows indicating which cells are included or impacted by the formula in the selected cell.

- To have Excel help with errors, click the **Error Checking** button.
- To trace the precedents of a cell move to that cell and click the **Trace Precedents** button. To trace the precedents of the precedents, click the **Trace Precedents** button more than once.
- To trace the dependents of a cell move to that cell and click the **Trace Dependents** button. To trace the dependents of the dependents, click the **Trace Dependents** button more than once.
- To clear all the arrows, click on the **Remove Arrows** button.

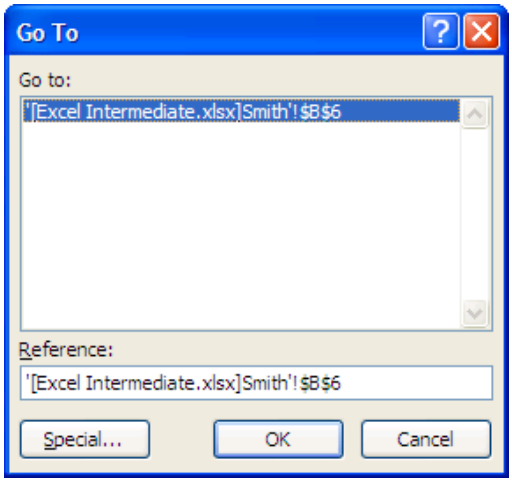
Precedent and dependent arrows always show the direction of the dependency. A circle marks the precedent cell and the point of the arrow marks the dependent cell.

Viewing Cells From Other Worksheets or Workbooks

If precedents or dependents are cells on another worksheet or workbook, an arrow points to a worksheet icon rather than the specific cell. To see the reference of this more remote cell, double click on the dotted arrow.



When you double-click the dotted arrow, the ***Go To*** dialog box displays indicating which cell and worksheet is used in your formula. Select the cell in the **Go to:** field, then click **OK** to move to that worksheet and cell.



Troubleshooting Formulas

When a complex formula does not work, it is useful to troubleshoot the problem by copying the formula to a new cell so that you can manipulate the formula without changing the original.

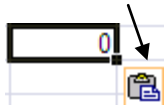
Copying a Formula to a New Cell While Retaining the Original Formula

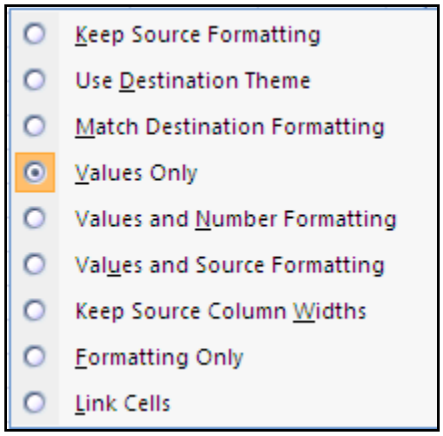
1. Double-click the cell containing the formula.
2. Press the **Home** key to go to the beginning of the formula.
3. Press the space bar or type an apostrophe (‘). With this as the first character of an entry, the entry is converted to text.
4. Highlight and copy the text entry to a new cell by using Copy and Paste, the fill handle, or drag and drop.
5. Edit the cell containing the formula to remove the space or apostrophe at the beginning of the entry to restore the formula.

Copying the Current Value of a Formula to a New Cell

If you copy data from a formula to another cell, the formula copies by default. Therefore, if you change or delete the original data, the resulting data changes or displays errors. You might, at times, only want the result of the formula copied to a cell – not the actual formula. Follow these steps to copy the formula as a value.

1. Right-click to select Copy, or press **Ctrl** + **C**, or use the copy tool to copy the formula into the clipboard.
2. Right-click to select Paste or press Ctrl + V, or use the paste tool to paste the formula Excel 2007 now displays a palette from which to choose paste options. Click the "**Palette**" button next to the cell to display the following options.





Values Only – Pastes the value from the formula in the selected cell. The value in the cell will not update if the formula result changes.

Link Cells – Pastes a link to the original formula which will update if the formula result changes.

Displaying All Formulas

Cool Tip!

To view all formulas on a worksheet, press **Ctrl** + **~** (upper-left on the keyboard).

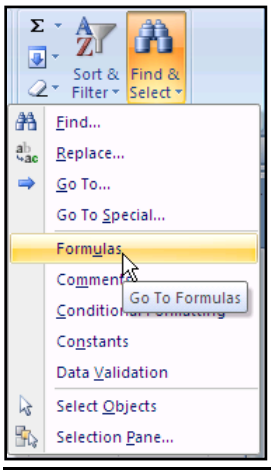
or

Click 

from the **Formula** tab.

Locating and Highlighting Formulas

You can also locate and select all formulas. From the **Home** tab, select Find & Select, Formulas.



All formulas on the worksheet display highlighted. If desired, format the formulas while highlighted to easily locate them. This makes it easy to view formulas to apply protection as described earlier in this class, beginning on page 15.

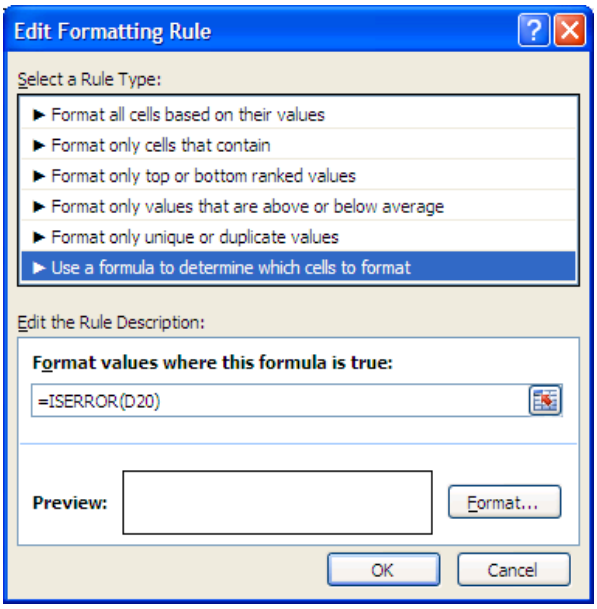
Hiding Errors in Formulas

If you have a worksheet that displays errors because not all data is entered in the cells referenced in your formulas, you can use Conditional Formatting to temporarily hide those errors.

From the **Home** tab, select Conditional Formatting; then click New Rule.

Enter the information as shown, =ISERROR, with the cell reference referring to the cell that contains the formula displaying an error (in this case D20).

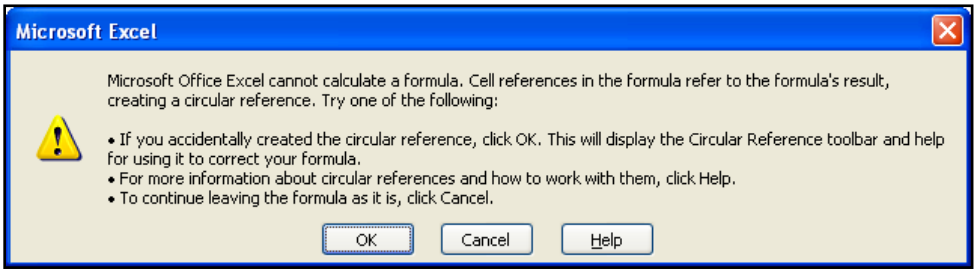
Click the **Format** button and format the font in the cell to white. **Note**: You can use the Format painter to copy the format to other cells.



Circular References

A circular reference is a reference in a formula that refers directly or indirectly to the cell containing that very formula. Most often these references have been accidentally created and are an error. One instance when a circular reference is created occurs when someone is pointing to other cells while writing a formula. If the writer of the formula incorrectly points back to the cell where the formula is to be entered, that reference is added to the formula and the formula contains a reference to the cell that contains the formula. Another way a circular reference might accidentally be created is by overshooting when selecting a range for a SUM or AVERAGE function and selecting the cell containing the function along with the cells that contain the data to be summed or averaged.

If the circular reference is the first circular reference in the worksheet, a dialog box displays as a warning.



Click **Cancel** and change your formulas as necessary.

Consolidating Worksheets

You can use data consolidation to assemble information from supporting worksheets into a single master worksheet. You can consolidate by position or by category. When you consolidate, you have a variety of functions available, such as Sum, Average, Max, Min, etc.

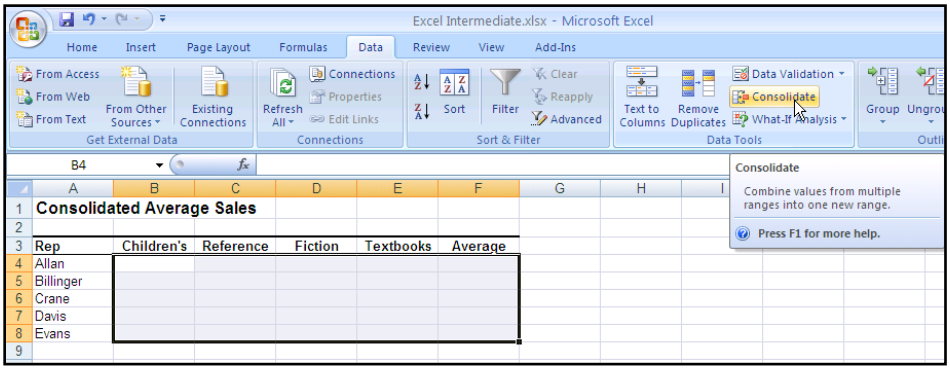
Consolidating by Position

The simplest way to consolidate is by position. However, this requires that all supporting worksheets have exactly the same layout.

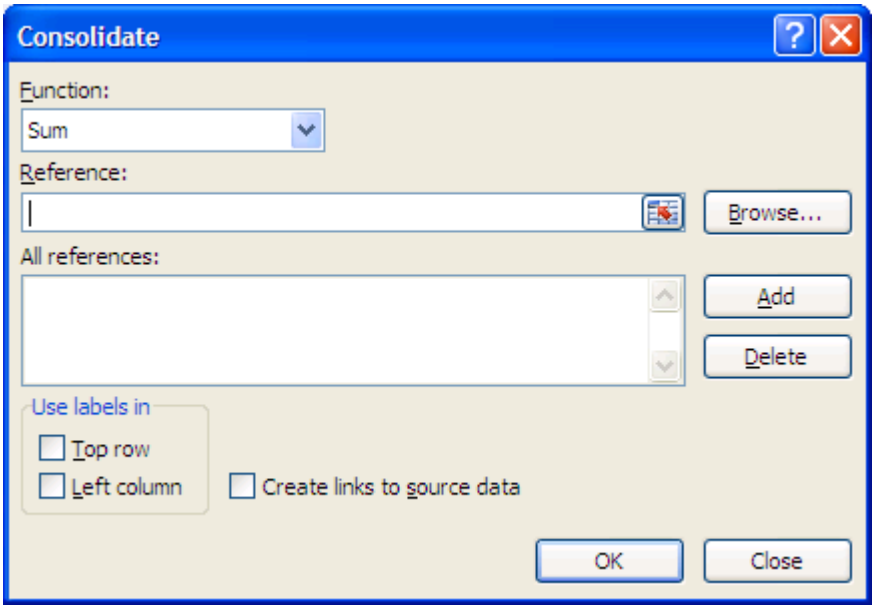
Follow these steps to consolidate by position.

1. Activate the worksheet on which you want to consolidate data.

2. Select the block of cells that will receive the consolidated data.



3. From the **Data** tab, select Consolidate. The ***Consolidate*** dialog box displays.

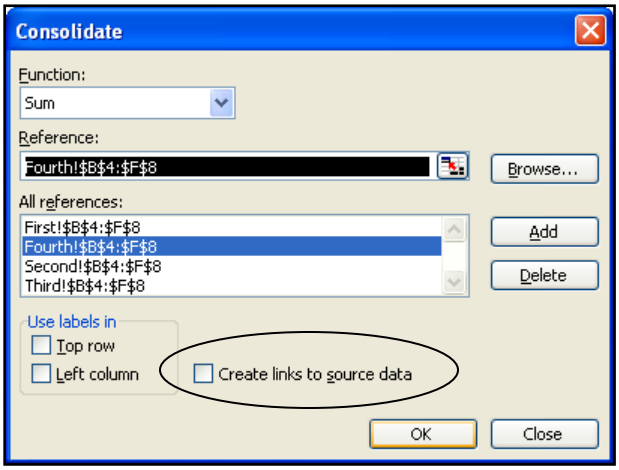


4. In the *Function:* field, select the desired function. For our class, we will select Sum.

5. In the *Reference*: field, enter the appropriate cell references. The references can be from the active workbook or from another workbook. These may be typed in or selected. When consolidating by position, all column and row references are the same, so you should only enter the cells containing the actual values that you want to consolidate.
   - If you type in the reference, it must have the following form:

     [Filename]Sheetname!Reference

     If the reference is in the same workbook, the filename is not necessary.
   - To select the reference, click the **Collapse Dialog** button and select the appropriate worksheet and the appropriate cells. Click to return to the dialog box.
6. Click Add to add the reference to the dialog box.
7. Enter the next worksheet and range of cells.
8. Click Add to add the reference to the dialog box. Repeat steps 5-7 until all cell references that you want to consolidate have been entered.



9. If you want any changes in the reference sheets to be updated in the consolidated worksheet, select **Create links to source data**. If this is not selected, only static values display which will not be updated.
10. Click **OK**. The consolidated values display in the worksheet.
11. If desired, format the numbers as appropriate.

Note: If you selected Create links to source data, Excel displays + and – options to expand and collapse information about consolidated source data.

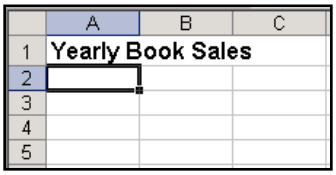
Consolidating by Category

You can also consolidate by category, which is a more useful option. In our example, we will have a different number of stores and different products for which to consolidate sales totals.

Follow these steps to consolidate by category.

1. Activate the worksheet on which you want to consolidate data. The consolidation worksheet has no row or column headings. Excel's Consolidate command will enter these for us.

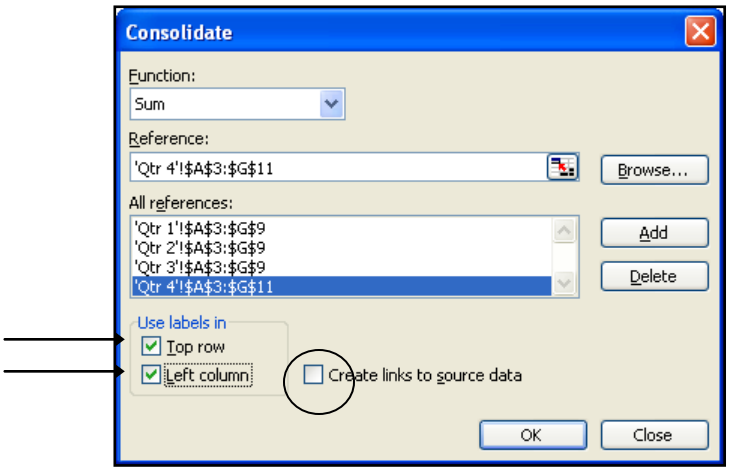
2. Select the first cell where you want the consolidated data to display.



3. From the **Data** tab, select Consolidate. The ***Consolidate*** dialog box displays.

4. Enter the appropriate cell ranges and click **Add** until ranges are entered. Be sure to include row and column headings in your selection(s).

5. Select **Use labels in Top row** and **Left column**.



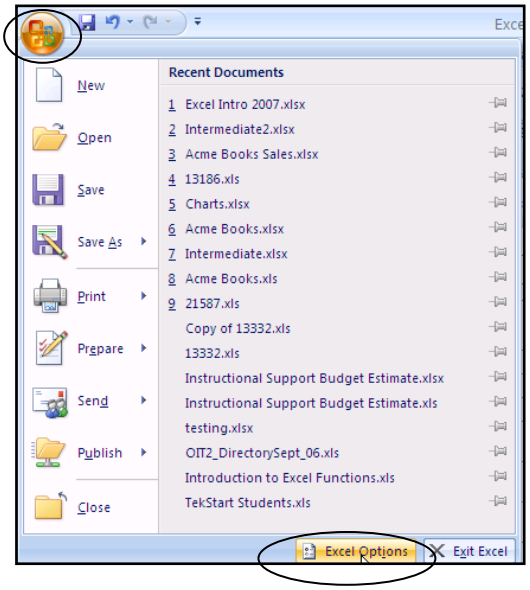
6. If you want any changes in the reference sheets to be updated in the consolidated worksheet, select **Create links to source data**.

7. Click **OK** to display the consolidated values.

8. If desired, format the numbers as appropriate.

Changing Excel's Default Settings

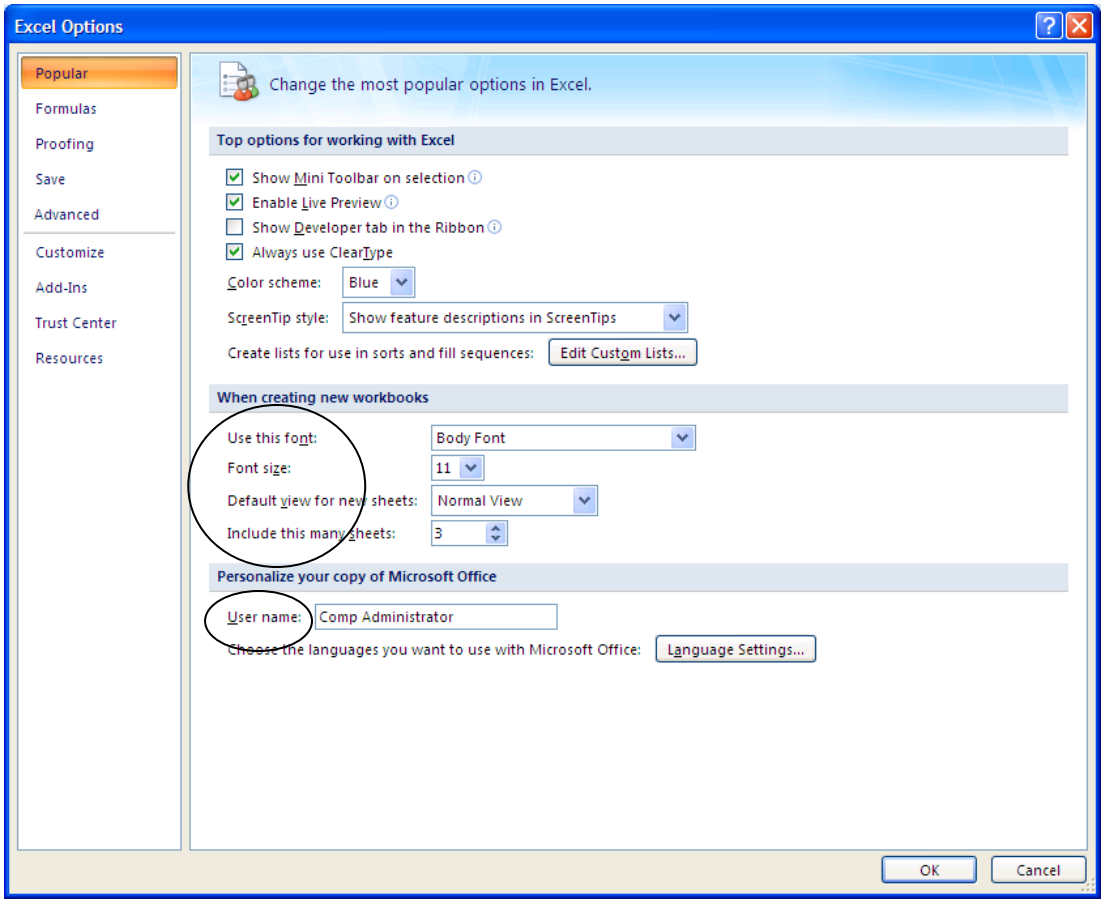
There are many features you can customize in Excel. To change these features, click the **Office** button in the upper-left corner of the Excel screen. At the bottom of the menu, select Excel Options. To get help with an option, click the ? in the upper right corner of the dialog box.



Some example settings are included in this document. However, these are personal preferences.

Popular Options

You can set several general options, such as the default font, the "user name" and how many worksheets are in new workbooks. Click the Popular link on the left to make your selections; then click OK.



Using Custom Lists

You can use Excel's default custom lists to quickly enter a series of data in a worksheet, or you can create your own.

Using the Fill Handle

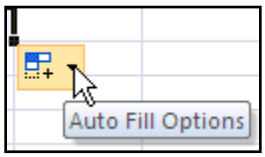
The fill handle is a very useful tool. It is the lower-right corner of the active cell or of the selected range. Dragging the fill handle fills the range across which you drag with the contents of the cell. A "fill" command might be nothing more than a copy command, but it can also mean that the pattern set by the first entry or entries will be followed in the range to be filled.

Excel's Default Custom Lists

Excel has custom lists for the months of the year and days of the week. For instance, if you want to enter all the months as column headings, simply type one month in a cell, then use AutoFill to enter the other months.

1. Select the cell (e.g., January) you want to AutoFill.
2. Rest your cursor on the "fill handle" of the selected cell. When your mouse pointer displays as a cross hair +, proceed to step 3.

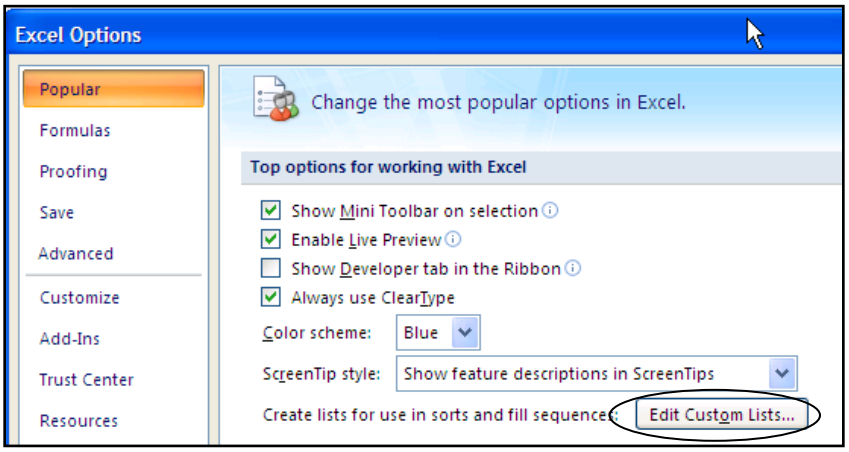
   Note: The fill handle is the small box in the lower-right corner of the selected cell.
3. Click and drag the fill handle in the direction to be filled. The fill handle displays an **Auto Fill Options** button. From the drop-down list, select the desired option. To create the list, select **Fill Series**. The default is copy cells, if no other selection is made.



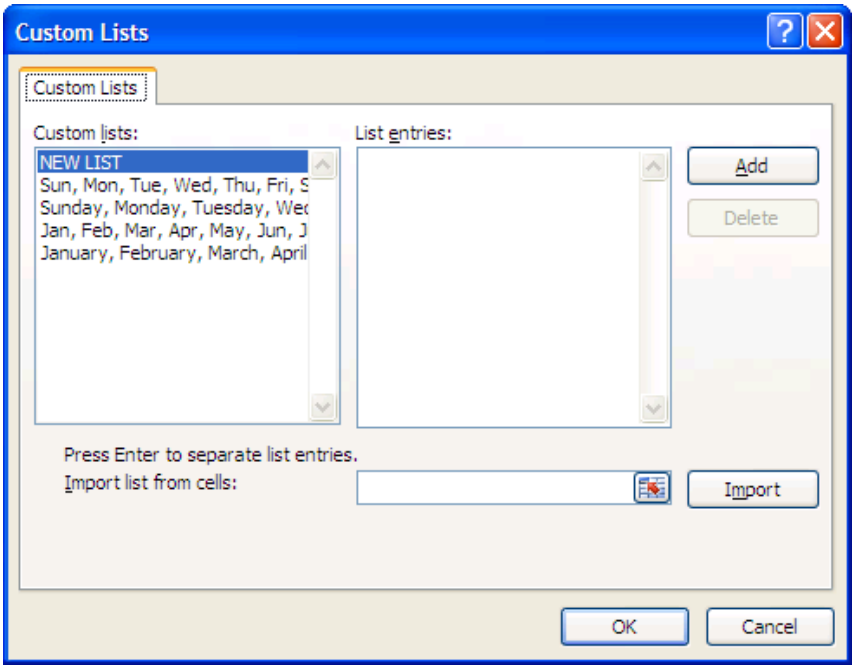
Creating a New List as an Option for the Fill Handle

You can also create your own list to fill cells.

1. Click the Office button  in the upper-left corner of the Excel screen.
2. At the bottom of the dialog box, select **Excel Options**.
3. Select **Popular** from the left side of the screen; then click the **Edit Custom Lists**.



4. Type the items in the **List entries** box.



5. Press **Enter** after each entry. (You can also use existing entries – see below.)
6. Click the **Add** button.
7. Click **OK**.

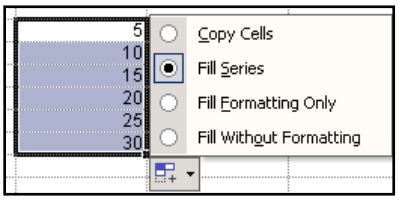
Using a Range of Existing Entries to Create a New List for the Fill Handle

1. Click the Collapse button in the *Import list from Cells* option to select list entries from a range of entries in a sheet.
2. Select the range.
3. Click to expand the dialog box.
4. Click **Import**.
5. Click **OK**.

Using the Fill Handle with a Range as the Pattern

A range can be used as the pattern for the fill to copy more than one cell or to fill a range with numbers that vary by a certain interval. Two cells are selected as the pattern for the fill command so that the interval is specified.

1. Select the range to be used as the pattern you want to fill.
2. Rest your cursor on the "fill handle" of the selected cell. When your mouse pointer displays as a cross hair +, proceed to step 3.
3. Click and drag the fill handle in the direction to be filled.

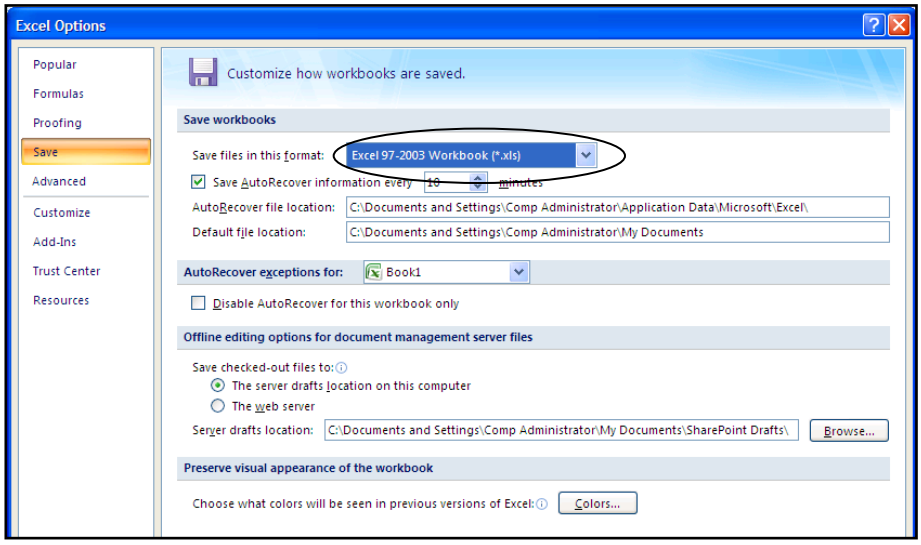


4. Select Fill Series, to fill in the desired pattern.

Note: Dragging up or to the left fills "backwards."

Default "Save As" Option

Because the Excel 2007 file type is an XML file, not all users who have previous versions will be able to open your workbooks. You may want to change the default Save As option to Excel 97 – 2003 by selecting the option from the Save files in this format drop-down box.



Course Practice File

You can access the practice file for this course from www.carlsonschool.umn.edu/oittraining. Click the link for Microsoft Excel 2007 - Intermediate; then click the Practice file link.