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Objectives

You will be able to:

- Create a formula, using the basic mathematical operators and functions
- Use AutoSum
- Use AutoCalculate

Process

Part A: Formulas

Formulas are mathematical equations that calculate new values from existing values. They allow you to use symbols called operators to add (+), subtract (-), multiply (*), and divide (/) numbers. **In Excel, each formula should begin with an equal (=) sign.** The equal sign tells Excel that everything in the cell is part of a formula.

Formulas can contain more than just numbers. They can also contain cell references. For example, if you type =B7+C7, Excel will add the values in cell B7 and cell C7. Using cell references instead of numbers is usually the best method to use for formulas because Excel automatically recalculates formulas if the value in a cell changes.

Some formula examples are:

=B7+C7+D7+E7

Sums the values of the 4 cells

=sum(b7:e7)

Sums the values of the 4 cells

=g64-g65

Subtracts the value in g65 from the value in g64




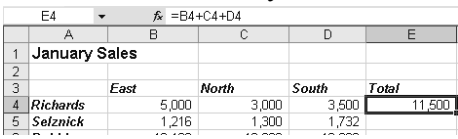



=(e200/12) *.15

Divides the value in e200 by 12
Then multiplies that answer by 15

=(f24*c10)-(f25*c10)

First, multiplies the value in f24 by the value in c10
Second, multiplies the value in f25 by the value in c10
Then subtracts the second value from the first value

Action Steps: Typing Formulas to Add Values and Using AutoSum

What you do		What happens
1.	To open a file, click on the Open tool  or choose FILE, OPEN from the menu.	Returns the Open dialog box.
2.	Follow the instructor’s directions to locate and open the file Excel step2 formulas..	Opens the lesson “Excel step 2 formulas.”.
3.	Review the four worksheets in this workbook by clicking on each worksheet tab.	Familiarize yourself with a workbook created by someone else.
4.	Click on the tab for the sheet1 worksheet.	Returns the January worksheet.
5.	Click in cell E4 .	Places the insertion point in E4.
6.	Type the formula =b4+c4+d4	
7.	Click on the Enter  tool in the formula bar.	Tells Excel you have completed your entry for that cell and keeps cell E4 as the active cell. Excel will calculate using the formula and display the formula answer in the cell as a value.
8.	Check your formula in the formula bar for accuracy. If changes need to be made, click in the formula bar to place the insertion point and make the changes. Then, click on the green check mark  .	You check for accuracy. 
9.	Click in cell B10 .	Places the insertion point in cell B10.
10.	Click on the AutoSum  tool.	Excel types the formula to add the numbers, using the function sum . The formula you see is =sum(b4:b9) . Note that Excel draws a “marquee” around the cells that are included in the formula.
11.	Click on the Enter  tool in the formula bar to accept the formula that AutoSum typed.	You accept the formula as correct. The marquee disappears and the formula is entered in the cell.
12.	Click in cell E5 . Click on the AutoSum  tool.	Excel does not select the group of cells that you want to add.






Cell references are not case-sensitive, which means that f25 and F25 are the same cell reference.



When you enter a formula in a cell, **the content of the cell is the formula**. The value you see (the answer to the formula) is displayed, **but is not the contents of the cell**.



=b5+c5+d5
and
=sum(b5:d5)
are the same calculation.

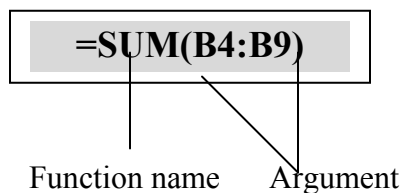
<p>13. With the mouse pointer as a white cross, drag across cells B5 through D5.</p>	<p>Excel revises the formula to sum the values in the cells that you selected.</p> <table border="1" data-bbox="711 262 1193 380"> <thead> <tr> <th></th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> </tr> </thead> <tbody> <tr> <td>1</td> <td colspan="5">January Sales</td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td><i>East</i></td> <td><i>North</i></td> <td><i>South</i></td> <td><i>Total</i></td> </tr> <tr> <td>4</td> <td><i>Richards</i></td> <td>5,000</td> <td>3,000</td> <td>3,500</td> <td>11,500</td> </tr> <tr> <td>5</td> <td><i>Selznick</i></td> <td>1,216</td> <td>1,300</td> <td>1,732</td> <td>=SUM(B5:D5)</td> </tr> </tbody> </table>		A	B	C	D	E	1	January Sales					2						3		<i>East</i>	<i>North</i>	<i>South</i>	<i>Total</i>	4	<i>Richards</i>	5,000	3,000	3,500	11,500	5	<i>Selznick</i>	1,216	1,300	1,732	=SUM(B5:D5)
	A	B	C	D	E																																
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<p>14. Click on the Enter  tool in the formula bar to accept the formula that AutoSum typed</p>	<p>You accept the formula as correct. The marquee disappears and the formula is entered in the cell.</p>																																				
<p>15. Click in cell C5.</p>	<p>C5 is the active cell.</p>																																				
<p>16. Type 1400 and click on the Enter  tool in the formula bar.</p>	<p>The contents of C5 are revised and the formula results in Cell E5 are recalculated.</p>																																				
<p>17. Click on the Undo  tool to reverse the change made in step 16.</p>	<p>The contents of C5 are returned to 1300 and the formula results in Cell E5 are recalculated.</p>																																				

Part B: Learn About Functions

Excel includes over 300 preset formulas called functions. **Functions** allow you to perform advanced calculations, such as finding the sum of a range of cells, averaging a series of values, or calculating the monthly payment for a loan.

Functions consist of a **name** followed by one or more arguments in parentheses. **Arguments** are usually numbers or cell references, but they may also be text. Arguments can be quite complex, but in this course, you will be using simple ones like those in the function in step 10 of your previous exercise.

Look at the parts of the formula that used a function in step 11.



When you enter a formula in a cell, **the content of the cell is the formula**. The value you see (the answer to the formula) is displayed, **but is not the contents of the cell**.

The basic **syntax** for a formula that uses a function has three parts:

- a. Equals sign
- b. Function name - The function SUM adds the group of values listed within the parentheses that follow.
- c. Argument, enclosed in parentheses - In this formula, you see the argument (B4:B9), which is read as **B4 through B9**.

There are no spaces in a formula. This formula adds the values in cells B4 through B9. The answer to the calculation is displayed in the cell B10, where you placed the formula.


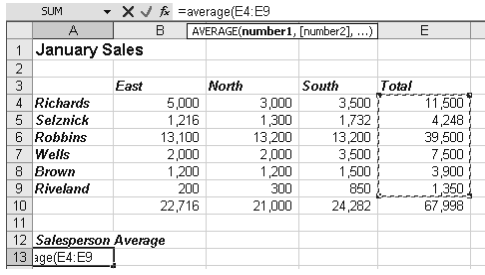

Functions often include references to **ranges**. A range is a group of cells that all touch one another and form a rectangle in shape. In your example, B4:B9 is the range of cells to be added.

A **range reference** consists of two cell references separated by a colon, such as C3:G18. C3 is the upper-left cell in the range and G18 is the lower-right cell in the range. A range reference includes all cells within the range.

New Terms

Function	A function is a preset formula that performs calculations. Functions consist of the function name followed by its arguments in parentheses. Some common functions are the SUM, AVERAGE, MIN, MAX, and COUNT functions.
Function Name	The function name appears immediately after the equal sign. It tells Excel which function to apply to the argument in parentheses.
Argument	An argument indicates the values or cells upon which a function will act. Arguments are usually numbers or cell references, but they may also be text.
Range	A range is a group of cells.
Range References	A range reference is used in a formula or function to indicate a group of cells. Range references consist of two cell references separated by a colon, such as C3:G18.
Colon Symbol	A colon symbol inserted between two cell references in a formula defines a range of adjacent cells. It means “through,” as in saying, “cells C3 through G18.”
Syntax	The syntax of a function refers to the order of the function's arguments. In some functions, the order of the arguments determines how Excel calculates the function.

Action Steps: Typing a Formula Using a Function

What you do		What happens
1.	Click in cell E6 .	Places the insertion point in E6.
2.	Type =sum(b6.d6	The function is typed to add the range of values in cells B6 through D6. Excel will change the period to a colon and will add the ending parenthesis.
3.	Click on the Enter  tool in the formula bar.	Tells Excel you have completed your entry for that cell and keeps cell E6 as the active cell. Excel will calculate using the formula and display the formula answer in the cell as a value.
4.	Place your mouse pointer on the file handle (small black square) in the lower right corner of cell E6 . When the pointer looks like a thin black cross, hold down the mouse button and drag down to cell E10 .	Copies the formula from cell E6 to cells E7 through E10. This is called AutoFill .
5.	Use the same procedure to copy the formula in B10 to C10 through D10.	Copies the formula from cell B10 to cells C10 and D10.
6.	Click in cell A13 .	A13 is the active cell.
7.	Begin to type the function to average the total sales per salesperson, =average(
8.	Instead of typing the range e4.e9, use your mouse to select the cells e4:e9 .	Excel types the range reference for you. You do not need to type the ending parenthesis. 
9.	Click on the Enter  tool in the formula bar.	Accepts the typing and displays the answer to the formula.

Your worksheet should look like this.

	A	B	C	D	E
1	January Sales				
2					
3		<i>East</i>	<i>North</i>	<i>South</i>	<i>Total</i>
4	<i>Richards</i>	5,000	3,000	3,500	11,500
5	<i>Selznick</i>	1,216	1,300	1,732	4,248
6	<i>Robbins</i>	13,100	13,200	13,200	39,500
7	<i>Wells</i>	2,000	2,000	3,500	7,500
8	<i>Brown</i>	1,200	1,200	1,500	3,900
9	<i>Riveland</i>	200	300	850	1,350
10		22,716	21,000	24,282	67,998
11					
12	<i>Salesperson Average</i>				
13		11,333			

Part C: Using AutoCalculate

The AutoCalculate feature on the status bar allows you to perform a function without inserting it into the worksheet. You can view the answer to common formulas without typing the formulas or including the formulas in your worksheet. The common functions that are available in AutoCalculate are: Average, Count, CountNums, Max, Min, Sum.

Action Steps

	What you do	What happens
1.	Select cells B4 through D9 .	Selects the cells in the range B4:D9.
2.	Look at the Sum value on the status bar.	Shows 67,998 as the sum of the selected cells in the AutoCalculate area on the status bar.
3.	Right click the Sum value on the status bar.	Opens the AutoCalculate menu.
4.	Point to and click Min .	Displays Min=200 in the AutoCalculate area on the status bar. The function Min finds the smallest value in the cell range.
5.	Right click the Min value on the status bar.	Opens the AutoCalculate menu.
6.	Point to and click Max .	Displays Max=13,200 in the AutoCalculate area on the status bar. The function Max finds the largest value in the cell range.



Lesson 2: Logic Statements

Overview

There are many different types of formulas that you can use in Excel. Another type of formula that is helpful in worksheets is the Logic Statement using the function IF. You will learn to use IF statements in this lesson.

Objectives

You will be able to:

- Create an IF statement

Process

IF statements test to determine if something is true or false. If it is true, one action occurs. If it is false, a different action occurs.

There are three (3) basic parts to an IF statement, since it is a function.

1. Equals sign
2. Function name - The function IF
3. Argument, enclosed in parentheses

=IF(LogicalTest, ValueIfTrue, ValueIfFalse)

Function name

Argument

The argument also has three (3) basic parts. Commas separate the 3 parts.

1. Logical Test – the question that can be answered TRUE or FALSE
2. Value If True – what you want Excel to do if the answer is TRUE
3. Value If False – what you want Excel to do if the answer is FALSE

The logic statement that you will use in your lesson is :

=IF(E4>=\$A\$13, "OK", "UNDER")

Logical Test


Value If True

Value If False

The statement is: If the Total Sales for the Salesperson (E4) are greater than or equal to the Salesperson Average (A13), enter OK in the cell, if not enter UNDER in the cell.

	A	B	C	D	E	F
1	January Sales					
2						
3		<i>East</i>	<i>North</i>	<i>South</i>	<i>Total</i>	
4	<i>Richards</i>	5,000	3,000	3,500	11,500	OK
5	<i>Selznick</i>	1,216	1,300	1,732	4,248	
6	<i>Robbins</i>	13,100	13,200	13,200	39,500	
7	<i>Wells</i>	2,000	2,000	3,500	7,500	
8	<i>Brown</i>	1,200	1,200	1,500	3,900	
9	<i>Riveland</i>	200	300	850	1,350	
10		22,716	21,000	24,282	67,998	
11						
12	Salesperson Average					
13		11,333				

Action Steps: Typing Logic Statements Using the IF function

What you do		What happens
1.	Click cell F4 .	F4 is the active cell.
2.	Type =IF(E4>=\$A\$13, "OK", "UNDER")	The quotation marks let Excel know to type the text inside them.
3.	Click on the Enter  tool in the formula bar.	Enters the formula and remains in cell f4. Since e4 (11,500) is greater than a13, (11,333), the word OK is entered into the cell by Excel.
4.	Use AutoFill to copy the formula to cells F5:F9 . Place the mouse pointer as a thin black cross on the file handle in the lower right corner of cell F4 . Drag to copy the formula to cells F5:F9.	The formula is copied to cells F5 through F9.

The formula used a cell reference of \$A\$13. This is called an **absolute cell reference**.

When you copy a formula from one cell to adjacent cells left or right in a row, Excel increments the column references in the cell by one (1). The dollar sign in front of the A tells Excel not to increment the column reference when you copy the formula.

When you copy a formula from one cell to adjacent cells up or down in a column, Excel increments the row references in the cell by one (1). The dollar sign in front of the 13 tells Excel not to increment the row reference when you copy the formula.



Here is a **“nested” IF function** that helps to calculate grades. Nested means that one IF function is inside another IF function. Imagine that you have a worksheet like you see below. This IF function could be entered into cell g4 and copied to the other cells in the column.

=IF(F5>89,"A",IF(F5>79,"B",IF(F5>69,"C",IF(F5>59,"D","F"))))

G5		=IF(F5>89,"A",IF(F5>79,"B",IF(F5>69,"C",IF(F5>59,"D","F"))))					
	A	B	C	D	E	F	G
1	COMPUTER BASICS 101						
2	Spring, 2001						
3	I am Brilliant, instructor						
4		test 1	test 2	test 3	test 4	Average	Grade
5	Donald Duck	60	70	50	70	62.5	D
6	Mickey Mouse	70	65	80	65	70	C
7	Just Goofy	70	85	70	85	77.5	C
8	Charlie Brown	75	90	80	90	83.75	B
9	Peppermint Patty	75	70	75	70	72.5	C
10	Mary Worth	80	75	80	75	77.5	C
11	Blondie Bumstead	85	90	95	90	90	A
12							

Lesson 3: Using Multiple Worksheets

Overview

When you determine how to organize your data in a workbook, it may be best to use more than one worksheet. Renaming a worksheet from the default name of “sheet1” to January or LibraryBid will make it easier to locate the data and read formulas.

With multiple worksheets, some of the formulas needed may include values that are stored on different worksheets. A formula that references cells on more than one worksheet is using **3D references**. The formula is called a **3D formula**.

Objectives

You will be able to:

- Rename a worksheet tab
- Create 3D formulas

Process

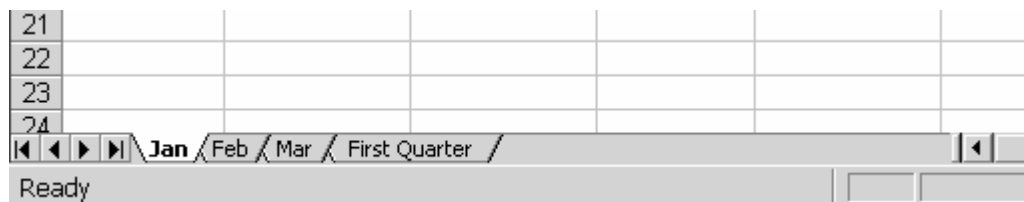
Part A: Renaming Worksheets

Renaming the worksheets will make it easier to locate the data. You will rename sheets 1 through 3.

Action Steps: Renaming a Worksheet

	What you do	What happens
1.	Double click on the worksheet tab named sheet1 .	Selects the word “sheet1.”
2.	Type Jan . Press ENTER.	The worksheet is renamed from sheet1 to Jan.
3.	Follow this same procedure to rename sheet2 to Feb and sheet3 to Mar .	The two worksheets are renamed to Feb and Mar.

Your worksheet tabs should look like this.



Part B: Creating 3-D Formulas

Excel allows you to create formulas that use values from several worksheets. Although you could type the formulas, it may be easier to do a combination of typing and “point and click” with the mouse. You type the mathematical symbols, but choose the values with the mouse by clicking on the value you want to place in your formula.

In this lesson, you create a formula on the First Quarter worksheet to add each salesperson’s totals for the months January through March.

New Terms

3-D Reference	A 3-D reference links worksheets or workbooks together so that they are automatically updated. When the name of a workbook and/or sheet tab appears in a formula followed by an exclamation point, the cell address is a 3-D reference. You can type 3-D references, but clicking the reference you want to add is easier because it automatically adds the exclamation point.
Exclamation Point	An exclamation point separates the sheet reference from the cell reference in formulas using 3-D references.

The completed 3-D formula will look like this:
=Jan!E4+Feb!E4+Mar!E4

Action Steps: Creating a 3-D Formula

What you do		What happens
1.	Click on the tab for worksheet First Quarter .	Returns the First Quarter worksheet.
2.	Type an =	Starts the formula.
3.	Click on the Jan tab.	Returns the Jan worksheet.
4.	Click on cell E4 .	Selects cell e4 and places it in the formula. Look at the formula bar.
5.	Type a + .	
6.	Click on the Feb tab.	Returns the Feb worksheet.
7.	Click on cell E4 .	Selects cell e4 and places it in the formula. Look at the formula bar.
8.	Type a + .	
9.	Click on the Mar tab.	Returns the Mar worksheet.
10.	Click on cell E4 .	Selects cell e4 and places it in the formula. Look at the formula bar.
11.	Click on the Enter <input checked="" type="checkbox"/> tool in the formula bar.	To complete the formula and have Excel enter the formula in the cell.
12.	Use AutoFill to copy the formula in cell B4 to cells B5 through B9.	The formula is entered in cells b5:b9.



At each click or typing entry, check the formula bar to be sure that the formula is correct.

		B4	=	=Jan!E4+Feb!E4+Mar!E4		
	A	B	C	D	E	
1	First Quarter Sales					
2						
3		<i>Total</i>				
4	<i>Richards</i>	279,500				
5	<i>Selznick</i>					
6	<i>Robbins</i>					
7	<i>Wells</i>					
8	<i>Brown</i>					
9	<i>Riveland</i>					
10						

Lesson 4: Exchanging Data Between Word and Excel

Overview

Choosing the software that is best for the task you need to accomplish will make it easier to complete the task. If you need to work with numbers or calculations or lists, Excel is a good tool to use. If the task requires that you work with mainly text or with a large quantity of text, Word is a good tool to use.

Some tasks are better performed when you use both Word and Excel to reach your goals. For example, you may need an Excel worksheet for the manipulation of figures, but the report for management purposes requires substantial text, which is best done in Word. You can combine the power of both programs to create the report you need.

Objectives

You will be able to:

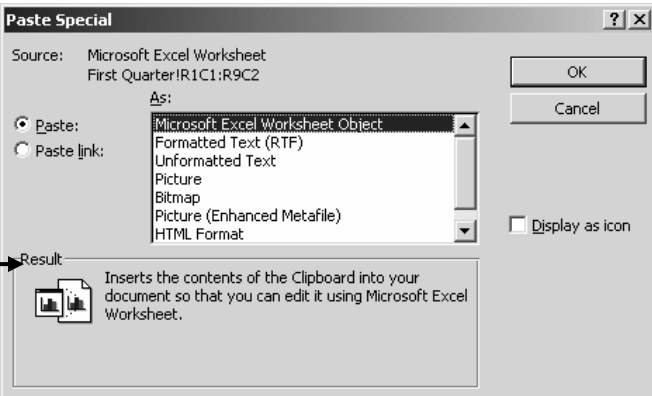
- Copy data from Excel to Word
- Use Paste Special to copy data from Excel to paste as an embedded object in Word
- Use Paste Special to link a Word document with an Excel spreadsheet

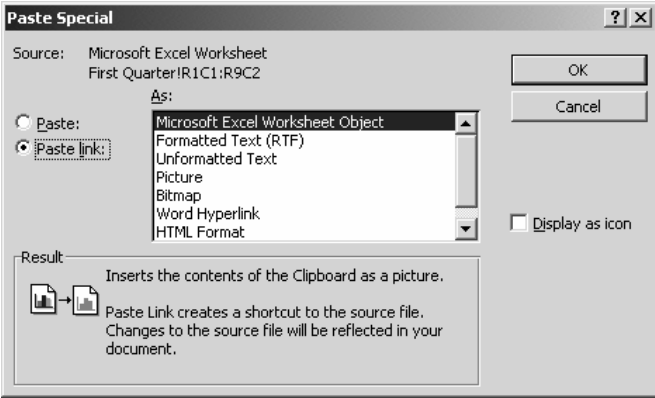
Process

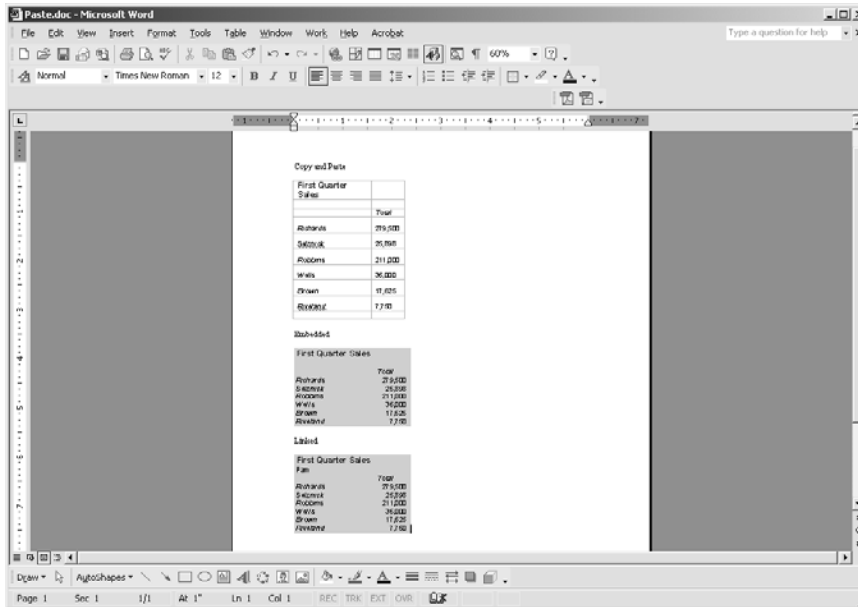
Part A: Action Steps – Copy Data from Excel to Word

	What you do	What happens
1.	Click on the worksheet tab for First Quarter .	The First Quarter worksheet is active.
2.	Select the range of cells A1:B9 .	The cells are highlighted.
3.	Place the mouse pointer over the highlighted range and right click and choose copy .	The marquee surrounds the range of cells that are copied to the Clipboard.
4.	Open Word from the Start button.	The main Word window and a document window are returned.
5.	Type “Copy and Paste.” Then press ENTER twice.	Begins the typing of the document.
6.	Right click the mouse and choose paste .	Pastes the Excel data into the document. The data is pasted as a Word table. It is as though you typed it in Word. If you want to make changes to the data in Word, you have the editing functions of Word tables. You do not have the editing functions of Excel.
7.	Press ENTER twice.	To insert two “blank” lines.

Part B: Action Steps – Paste Special for Object Linking and Embedding

What You Do	What Happens
1. Type “Embedded.”	Enters text.
2. Press ENTER three times.	To insert three “blank” lines.
3. Press the UP ARROW key to place the cursor up one line.	Places the cursor.
4. From the menu, click on EDIT, PASTE SPECIAL .	The Paste Special box is returned.
5. Be sure the radio button for Paste is selected. Then click on Microsoft Excel Worksheet Object .	<p>Read the text under Result.</p> <p>Paste Special, Paste will copy the section of your worksheet into the Word document, but you will be able to use Excel to edit the worksheet.</p> 
6. Click on OK .	The worksheet data is pasted into your Word document as an embedded object .
7. Double click on the worksheet data that is an embedded object. Look at the toolbars . The Excel toolbars are available to you for editing, but the title bar tells you that you are in Word.	The toolbars change. The object takes on the appearance of an Excel worksheet.
8. Click below the object to place the cursor.	Places the cursor.
9. Type “Linked.”	Enters the text.
10. Press ENTER three times.	Enters three “blank” lines.
11. From the menu, select EDIT, PASTE SPECIAL .	Returns the Paste Special Box.

What You Do	What Happens
<p>12. Select the radio button for Paste link. Select Microsoft Excel Worksheet object, if it is not selected.</p>	<p>Read the text in the Result area.</p> <p>When you save this file and save the Excel file, the two will be linked now and in the future. Future saved changes made in the Excel file, will appear in the “copy” of the worksheet when the Word file is opened.</p> 
<p>13. Click on OK.</p>	<p>The section of the worksheet that is in the Word document is linked to the Excel worksheet.</p>
<p>14. Save the Word document as <u>Paste</u> in the My Documents folder.</p>	<p>The document is saved. It should look like the document shown below.</p>



<p>15. Switch to the Excel window. Close the workbook and Excel.</p>	
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What You Do		What Happens
16.	In the Word document, double click on the linked object.	Excel and the linked workbook are opened.
17.	In Excel, click in cell A2 to make that cell active.	Cell A2 has a black border displayed.
18.	Type your name. Press ENTER to complete the typing.	Enters the text.
19.	Switch to Word.	The Word windows are displayed.
20.	Note that your Excel changes are displayed in Word.	In order for the link to function correctly: a. Save the files in Excel and Word in order to save the changes in the Excel file and the instructions for the link in the Word file. b. Both the files do not need to be open for the link to function. c. If either file is deleted or the Excel file is moved, the link is broken.