


# Excel Basics

## (Weather Watch Sample)

 This tutorial explains some of the basic features of Microsoft Excel.

- |                                       |   |                                     |                                      |
|---------------------------------------|---|-------------------------------------|--------------------------------------|
| 1. <a href="#">Start Excel</a>        | 5. <a href="#">Auto-Fill</a>                          | 9. <a href="#">Functions</a>        | 13. <a href="#">Charts</a>           |
| 2. <a href="#">Text &amp; Numbers</a> | 6. <a href="#">Format Numbers</a>                     | 10. <a href="#">Borders</a>         | 14. <a href="#">Multimedia Tools</a> |
| 3. <a href="#">Column Widths</a>      | 7. <a href="#">Formulas</a>                           | 11. <a href="#">Cell Comments</a>   | 15. <a href="#">Sorting</a>          |
| 4. <a href="#">Selecting Rows</a>     | 8. <a href="#">Absolute &amp; Relative References</a> | 12. <a href="#">Multiple Sheets</a> | 16. <a href="#">Protection</a>       |

In this tutorial we will create a sample spreadsheet. The finished product is displayed below:

	A	B	C	D	E	F	G
1	<b>Weather Watch - Daily Temperatures - May 2000</b>						
2							
3	<b>Date</b>	<b>Daily High Temp</b>		<b>Daily Low Temp</b>		<b>Record?</b>	
4		<b>Observed</b>	<b>Diff from Norm</b>	<b>Observed</b>	<b>Diff from Norm</b>	<b>High</b>	<b>Low</b>
5	01-May	-5.0	-23.0	-26.0	-36.0		*
6	02-May	6.0	-12.0	-4.0	-14.0		
7	03-May	15.0	-3.0	10.0	0.0		
8	04-May	19.5	1.5	12.0	2.0		
9	05-May	18.0	0.0	13.0	3.0		
10	06-May	23.0	5.0	15.0	5.0		
11	07-May	26.0	8.0	17.0	7.0		
12	08-May	30.0	12.0	19.0	9.0	*	
13	09-May	27.0	9.0	15.0	5.0		
14	10-May	25.5	7.5	13.0	3.0		
15							
16	<b>AVERAGE</b>	18.5	0.5	8.4	-1.6		
17	<b>MINIMUM</b>	-5.0	-23.0	-26.0	-36.0		
18	<b>MAXIMUM</b>	30.0	12.0	19.0	9.0		
19							
20	<b>HISTORICAL</b>	18.0	30.0	10.0	-25.0		
21		<b>Normal High</b>	<b>Record High</b>	<b>Normal Low</b>	<b>Record Low</b>		
22							
23	<p>This spreadsheet is based on Illustrative Example SC05.1 from the Alberta Learning ICT Program of Studies. It relates to the Alberta Grade 5 Science curriculum, Topic D: Weather Watch (Specific Learner Expectation #7, pg. B27).</p>						
24	<p>In this activity, students use a spreadsheet to record weather data (daily high &amp; low temperatures) over a period of time. Students will be asked to perform calculations with this data (average, minimum, maximum, difference) and analyze the information to discover relationships and patterns. Ultimately this information will be used to help students learn about the importance of forecasting weather.</p>						
25							
26							
27							
28							
29							
30							
31							
32							

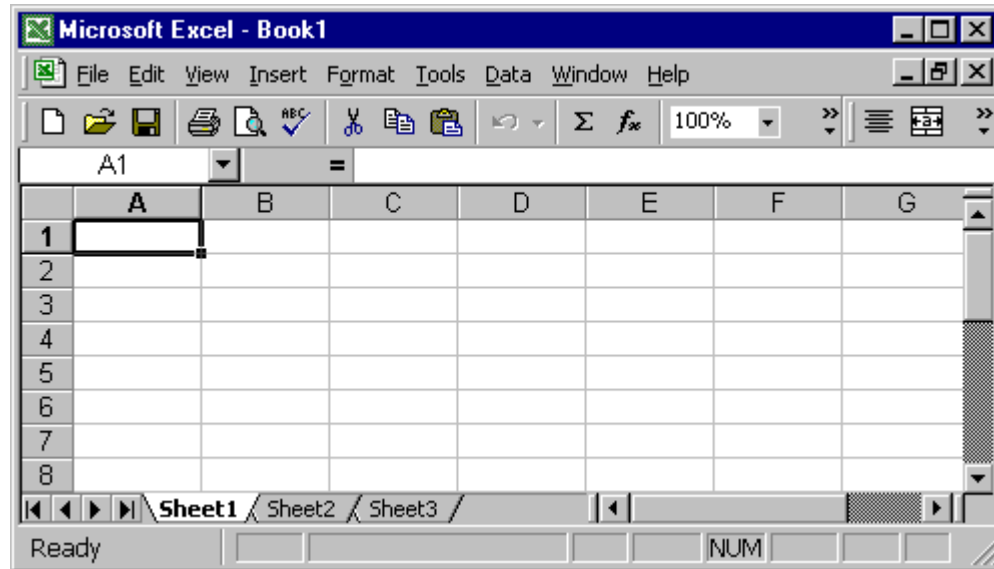
## Start Excel

# Excel Basics

- Launch **Excel**. (Usually on Windows computers you can click on the Windows **Start** menu / **Programs** / **Microsoft Excel**. Check with your instructor if you are not sure how to launch Excel on the computer you are using.)



- A blank Excel spreadsheet appears.



A

computerized spreadsheet can make it easier to perform calculations and experiment with numbers. With a spreadsheet you can type in equations once and then change the data many times with the computer automatically re-doing the calculations for you (unlike using a hand-held calculator or working out equations by hand!).

A spreadsheet is a grid of columns and rows - the computer equivalent of a paper ledger sheet. The intersection of each row and column is called a "cell". Cells are referred to by their column letter and row number. e.g. The cell highlighted in the picture is called **cell A1**, the cell to the right of it is **B1**, the cell below it is **A2**, etc.

- At any time, you can start a new spreadsheet by clicking on the Excel **File** menu and selecting **New**, or open an existing file by selecting **File / Open**.



# Excel Basics

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## Text & Numbers

- First we will explain how to enter and format some text and numbers in the first few rows of the spreadsheet as shown below:

	A	B	C	D	E	F	G
1	<b>Weather Watch - Daily Temperatures - May 2000</b>						
2							
3	<b>Date</b>	<b>Daily High Temp</b>		<b>Daily Low Temp</b>		<b>Record?</b>	
4		<b>Observed</b>	<b>Diff from Norm</b>	<b>Observed</b>	<b>Diff from Norm</b>	<b>High</b>	<b>Low</b>
5	01-May	-5.0		-26.0			
6	02-May	6.0		-4.0			
7	03-May	15.0		10.0			
8	04-May	19.5		12.0			
9	05-May	18.0		13.0			
10	06-May	23.0		15.0			
11	07-May	26.0		17.0			
12	08-May	30.0		19.0			
13	09-May	27.0		15.0			
14	10-May	25.5		13.0			

- To enter information into a spreadsheet, you simply click the mouse on the cell where you want data to appear, and then type.
- Click your mouse in Cell A1 and type "Weather Watch - Daily Weather Information - May 2000", then press the **Enter** key. Notice that if a cell is not wide enough to hold the text you type, the text simply spills into the adjoining cells to the right.
- To give the text bold styling, click on Cell A1 again, then click the **Bold** button **B** at the top of the screen (same as word processing, right?).
- Still on Cell A1, increase its font size by clicking on the **Font Size** drop-down list  (the example is set to 12 point).
- Now, how do we get the text in Cell A1 to appear centered between columns A to G? Simple in Excel. First, highlight cells A1 through G1 (click and hold the mouse button down on A1 then drag to the right to G1 - or click on A1, then move the mouse to G1, hold the shift key down and click the mouse). Second, click the **Merge and Center** button . Cells A1 through G1 are now merged (treated as if they were one cell) and the text is now centered within this larger cell area.

# Excel Basics

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## Column Widths

- Now, type the text that you see in the cells in rows 3 and 4 in the above example (Note: "Daily High Temp" goes in B3, "Daily Low Temp" goes in D3, and "Record?" goes in F3). Without the formatting applied in our example, your data will probably look something like:

	A	B	C	D	E	F	G
1	<b>Weather Watch - Daily Temperatures - May 2000</b>						
2							
3	Date	Daily High Temp	Daily Low Temp	Record?			
4		Observed	Diff from N	Observed	Diff from N	High	Low

- There are several little formatting operations we can do to make the titles in rows 3 and 4 look a little nicer.
- First of all, we need to **widen columns** C and E so that the text entered in cells C4 and E4 is completely visible. To widen column C, place the mouse on the boundary between columns C and D at the top where the column names are. The cursor should turn to a double arrow as shown in the picture below. Click, hold, and drag the mouse to the right until column C is wide enough to display all of the text in Cell C4 (i.e. "Diff from Norm"). Similarly, widen column E.



- How would you **narrow a column**? You guessed it - do the same thing as above except drag left instead of right. See if you can make columns F and G narrower. Another trick: instead of dragging the cursor, just double-click it for an **auto-fit** (automatically adjust to the widest entry in the column).



# Excel Basics

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## Selecting Rows

- Second, we want all of the text in rows 3 and 4 to be in **Bold** style. This can be done in one fell swoop - no need to do each cell one at a time. One quick method is to select all of rows 3 and 4 - to do this place the cursor over the number 3 (which indicates row 3) on the far left, click and hold the mouse button, then drag the mouse down to the number 4 below it, and finally release the mouse button (all of rows 3 and 4 should be highlighted as shown below). Then, of course, click the **Bold** button **B**.

	A	B	C	D	E	F	G	H	I
1	<b>Weather Watch - Daily Temperatures - May 2000</b>								
2									
3	Date	Daily High Temp	Daily Low Temp	Record?					
4	Observed	Diff from N	Observed	Diff from N	High	Low			

- While you have Rows 3 and 4 highlighted, also click on the Center button  to make all of the text centered within each cell in those rows.
- Finally, do that **Merge and Center**  operation on cells B3 and C3, then again on cells D3 and E3, and again on cells F3 and G3.

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## Auto-Fill

- Now, let's enter those **dates** that belong in column A. Click on cell A5 and type "01-May".
- Here's a trick to help you quickly enter the dates "02-May" to "10-May":
  - Click on cell A5, then position the mouse in the bottom right of the cell so that the cursor turns to a small black plus sign, as shown below.
  - With the cursor as such, click, hold and drag the mouse down to cell A14, and then release the mouse.
  - Excel automatically copies the date and increments by one day for each cell going down, giving you the series 01-May, 02-May, ... , 10-May.

3	Date
4	
5	01-May
6	

- **Note:** Advanced options on creating such auto-fill series are available with the menu command **Edit / Fill / Series**.

# Excel Basics

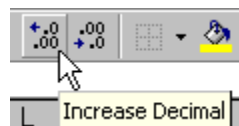
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## Format Numbers

- Type the raw data (numbers) that belong in cells B5 to B14 and cells D5 to D14. e.g. in Cell B5 type "-5". Don't bother typing the ".0" part, only type the decimal part of numbers if it is non-zero. By default, Excel will strip off the zero decimal anyway.
- To get all of the numbers you just typed in to be displayed all aligned nicely with a consistent number of decimal places, you have to set a number formatting option. In this example, we will eventually want all of the cells in the rectangular area from B5 to E14 to be displayed with one decimal. We can format all of those cells now, even though some of them don't have data in them yet.
- To do this, first highlight the whole block of cells (click on cell B5, then shift-click on cell E14 - or - click-hold-drag from B5 to E14).

	A	B	C	D	E	F	G
1	Weather Watch - Daily Temperatures - May 2000						
2							
3	Date	Daily High Temp		Daily Low Temp		Record?	
4		Observed	Diff from Norm	Observed	Diff from Norm	High	Low
5	01-May	-5		-26			
6	02-May	6		-4			
7	03-May	15		10			
8	04-May	19.5		12			
9	05-May	18		13			
10	06-May	23		15			
11	07-May	26		17			
12	08-May	30		19			
13	09-May	27		15			
14	10-May	25.5		13			
15							

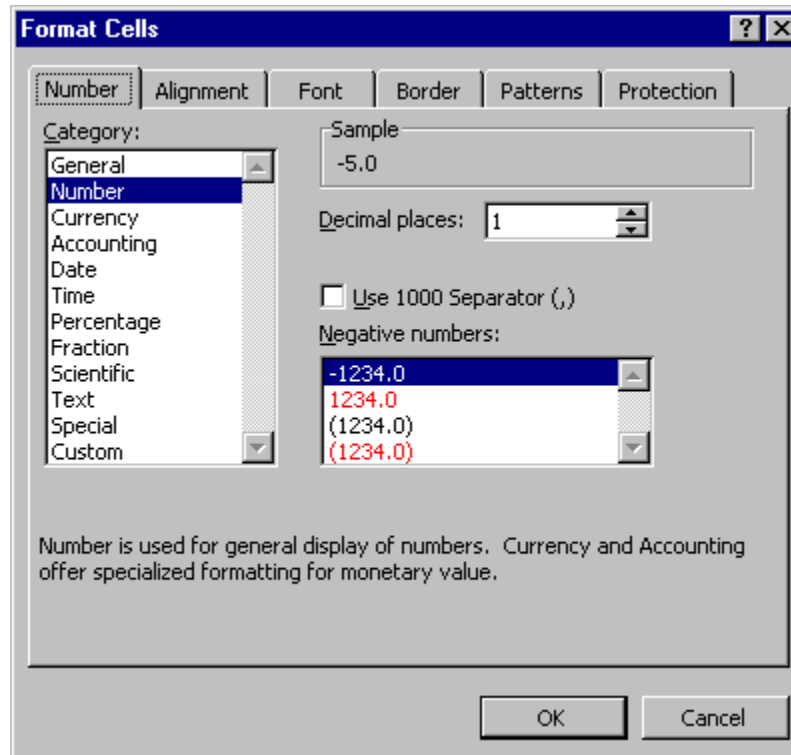
- You can then set the number of decimals in two ways:
  - Click once on the **Increase Decimal** button.



- or -

- Click on the **Format** menu and click on **Cells**. On the **Number** tab, set the options as shown below, then click the **OK** button.

# Excel Basics

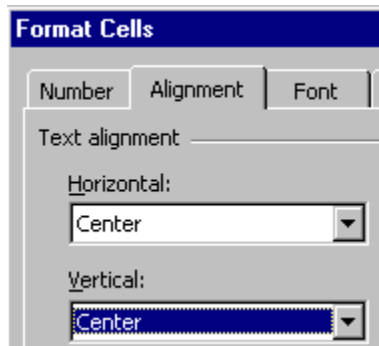


	A	B	C	D	E
1	<b>Weather Watch - Daily Temperatures - May</b>				
2					
3	<b>Date</b>	<b>Daily High Temp</b>		<b>Daily Low Temp</b>	
4		<b>Observed</b>	<b>Diff from Norm</b>	<b>Observed</b>	<b>Diff from Norm</b>
5	01-May	-5.0		-26.0	
6	02-May	6.0		-4.0	
7	03-May	15.0		10.0	
8	04-May	19.5		12.0	
9	05-May	18.0		13.0	
10	06-May	23.0		15.0	
11	07-May	26.0		17.0	
12	08-May	30.0		19.0	
13	09-May	27.0		15.0	
14	10-May	25.5		13.0	

- Now, see if you can add the additional text and numbers in cells A16 to E21 shown below. The text labels ("AVERAGE" ... "Record Low") should all be **Bold** and **Centered**. The numbers in cells B20 to E20 should be formatted with **one decimal place**. Cells A20/21 are a little tricky: "HISTORICAL" should be typed into cell A20, then **Merge and Center** cells A20 and A21, then click on **Format / Cells / Alignment / Vertical: Center**.

# Excel Basics

	A	B	C	D	E
14	10-May	25.5		13.0	
15					
16	<b>AVERAGE</b>				
17	<b>MINIMUM</b>				
18	<b>MAXIMUM</b>				
19					
20	<b>HISTORICAL</b>	18.0	30.0	10.0	-25.0
21		<b>Normal High</b>	<b>Record High</b>	<b>Normal Low</b>	<b>Record Low</b>



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## Formulas

Now for the real power of spreadsheets - formulas! (If you're not going to use formulas in a spreadsheet, you're just as well off to simply use a word processor and create a table to format information as we've done so far with the text and numbers above.)

- In Column C, we want to insert equations which will **calculate the difference** between the observed daily high temperatures (from column B) and the historical normal high (from cell B20).
- In cell C5 type the following (include the =, all Excel formulas must start with this symbol, the reason for the \$ will become apparent later):  
**=B5-\$B\$20**
- Press the **Enter key** when you are done typing the formula.
- If you typed in the same data as our example, you should see the result -23.0 displayed in cell C5.

# Excel Basics

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## Absolute & Relative References

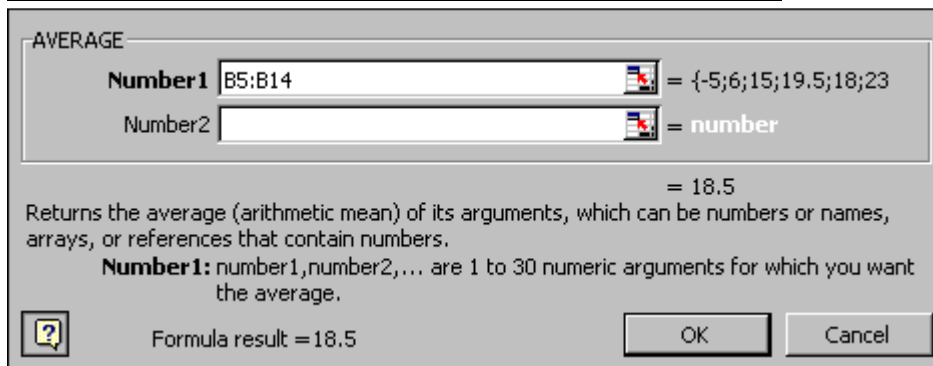
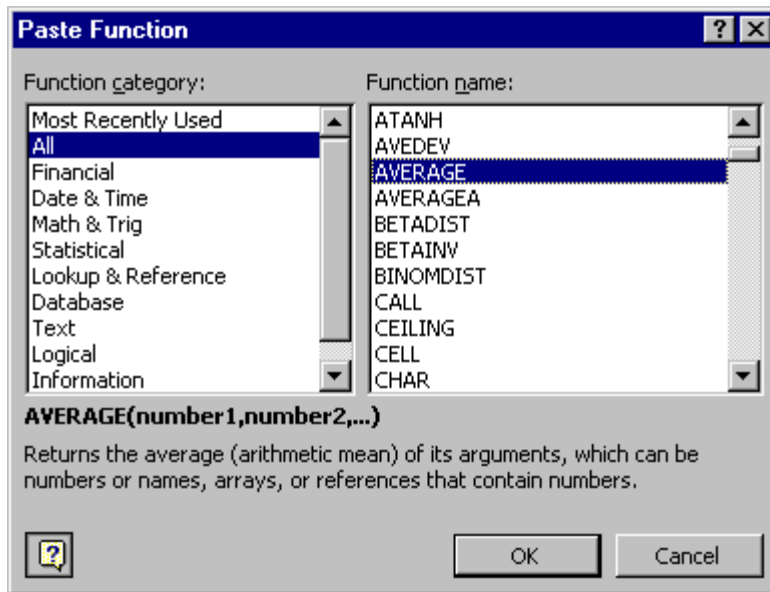
- A similar formula must be placed in cells C6 to C14, but you won't have to retype it! We can **copy formulas** using the same technique used earlier to copy the dates in column A.
- Click on cell C5, then position the mouse in the bottom right of the cell so that the cursor turns to a small black plus sign. With the cursor as such, click, hold and drag the mouse down to cell C14, and then release the mouse. Excel automatically copies the formula and increments the row number from the original B5 cell reference for each cell going down. Notice, however, that it didn't alter the \$B\$20 cell reference - but that is good because every one of these difference equations must refer to that exact cell (B20). B5 is an example of a **relative cell reference** (it is automatically adjusted when copying a formula to other cells), while \$B\$20 is an example of an **absolute cell reference** (it is left as is when copying to other cells).
- See if you can figure out what formula should be typed into cell E5 to calculate the difference between the observed daily low temperatures (from column D) and the historical normal low (from cell D20). Copy the formula to cells E6 to E14.
- Here's one further subtle detail - **a cell reference can be partially relative and partially absolute**. We could have typed **=B5-B\$20** into cell C5 and the copying down to the other cells would still have worked fine. B\$20 means that the column part (B) is relative and the row part (\$20) is absolute. See what happens if you click on cell C5 (containing this new version of the formula), then click on **Edit / Copy**, then click on cell E5, and then click on **Edit / Paste**. You should see **=D5-D\$20** in cell E5. With a good understanding of how relative and absolute cell references work, we can really avoid unnecessary typing of formulas - we can use auto-filling or copy/paste all over the place!

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## Functions

- In row 16, we want to create equations which will automatically calculate the average of the values in columns B to E.
- In cell B16 type:  
**=AVERAGE(B5:B14)**
- **AVERAGE** is a built-in Excel function which automatically calculates the average of a set of values - much easier than typing in an equation such as  $(B5+B6 \dots +B14) / 10$ . B5:B14 is called a **range of cells**, and refers to the whole block of cells from B5 to B14 inclusive.
- There is a second way to insert a function into a cell. Click on the cell (in this case B16), then click on **Insert / Function** - this opens the **Paste Function** window. Choose the desired function (in this case AVERAGE), then click **OK**. This opens another window which lets you indicate which cells the function should operate on. To the right of **Number 1**, type the desired range of cells (or you can even indicate the cells with the mouse by highlighting the blocks of cells directly on the spreadsheet). Click OK again and the correct formula should appear on the spreadsheet.

# Excel Basics

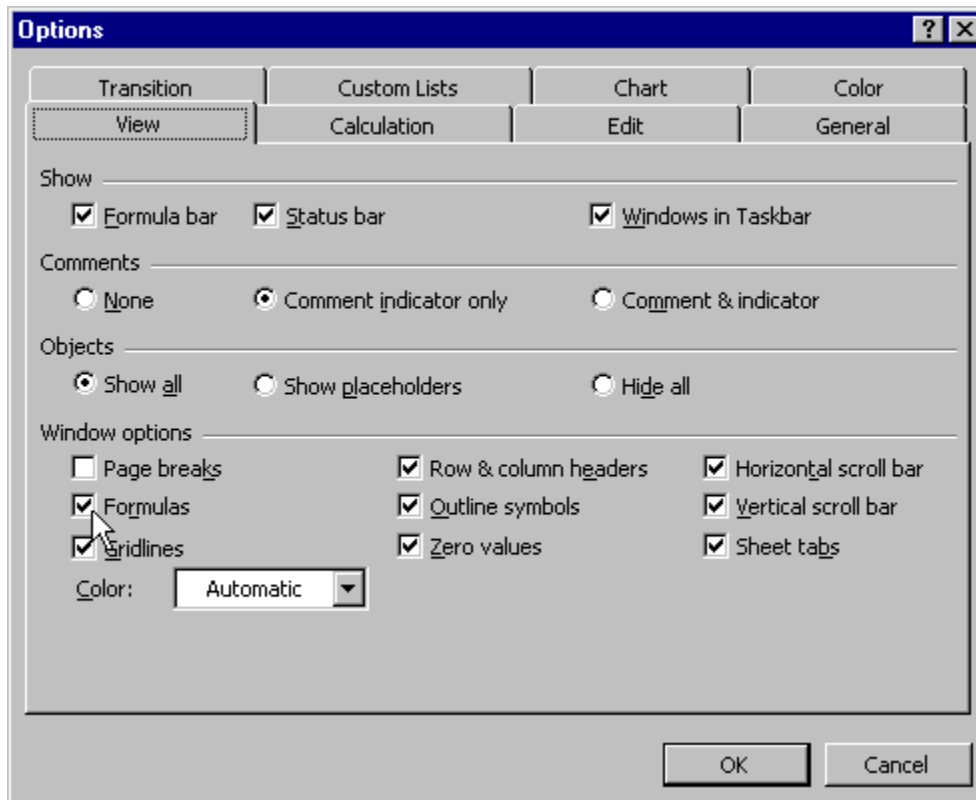


- A similar formula must be placed in cells C16 to E16, but again, you won't have to retype it! We can **copy formulas** using the same technique used earlier.
- Click on cell B16, then position the mouse in the bottom right of the cell so that the cursor turns to a small black plus sign. With the cursor as such, click, hold and drag the mouse (to the right this time) to cell E16, and then release the mouse. Excel automatically copies the formula and increments the column letters from the original B5:B14 cell range reference for each cell going across.
- In rows 17 and 18, we would like to display the **minimum** and **maximum** of the values in columns B to E. See if you can use the function **MIN** to create the equations for row 17 (cells B17 to E17) and the function **MAX** to create the equations for row 18 (cells B18 to E18). The correct formulas are shown below.

	A	B	C	D	E
16	<b>AVERAGE</b>	=AVERAGE(B5:B14)	=AVERAGE(C5:C14)	=AVERAGE(D5:D14)	=AVERAGE(E5:E14)
17	<b>MINIMUM</b>	=MIN(B5:B14)	=MIN(C5:C14)	=MIN(D5:D14)	=MIN(E5:E14)
18	<b>MAXIMUM</b>	=MAX(B5:B14)	=MAX(C5:C14)	=MAX(D5:D14)	=MAX(E5:E14)

# Excel Basics

Note: To change the spreadsheet view as shown above (see actual formulas in the cells instead of their numeric results) - on the **Tools** menu, click **Options**, click the **View** tab, then place a checkmark beside **Formulas**, then click **OK**.



- In column F we want to insert formulas which flag whether or not a record high temperature was reached on any of the days.
- In cell F5 type the formula shown below, then copy it to cells F6 to F14:  
**=IF(B5>=\$C\$20,"\*","")**

**Note:** Some Macintosh versions of Excel require a semicolon (;) instead of a comma (,) to separate the parts of the IF function; if you use a comma you get a message stating that there is a syntax error in your formula.


- The above formula makes use of the **IF** function to allow us to compare one value to another and then set the cell contents based on the result of the comparison using the syntax:  
**=IF(logical\_test,value\_if\_true,value\_if\_false)**  
The **logical\_test** we are using is **B5>=\$C\$20** (i.e. is the observed daily high temperature greater then or equal to the record high).  
The **value\_if\_true** we are using is **"\*"** (i.e. put a \* in the cell if the logical test is true).  
The **value\_if\_false** we are using is **""** (i.e. put nothing (an empty text string) in the cell if the logical test is false; if we didn't specify the value\_if\_false, Excel would put the word "FALSE" into the cell, which would look a little messy).

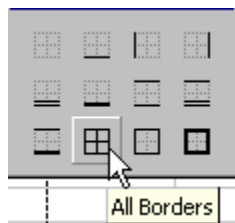
# Excel Basics

- Similarly, to flag new record low temperatures, in cell G5 type the formula shown below, then copy it to cells G6 to G14:  
`=IF(D5<=$E$20, "*", "")`
  - If you have entered the data and formulas as per our sample, a "\*" should appear in two cells: G5 (01-May had a record low) and F12 (08-May had a record high)
- 

## Borders

Another formatting feature which can improve the readability of a spreadsheet is to add borders around cells. This is especially useful if you are going to print your spreadsheet because, by default in Excel, the light gray cell gridlines don't appear when you print a spreadsheet document.

- To set borders, first select the cells on which you want to put borders.
- Then click the **Borders** button on the toolbar at the top of the screen. 
- Select a border style from the options that are displayed. In the example below, the **All Borders** options is selected - this places a single line around all sides of all of the selected cells.



- In the sample spreadsheet displayed at the beginning of this tutorial, you will notice borders around various parts of the spreadsheet - this helps to separate it into logical sections.
  - Highlight cells A3 to G14 (the daily temperatures area), click on the **Border** button as shown above, and select the **All Borders** style.
  - Do the same with the area A16 to E18 (averages, maximums, and minimums) and the area A20 to E21 (historical data).
  - The following print preview snapshot shows what would appear on a printout with the borders applied as indicated above:

# Excel Basics

Weather Watch - Daily Temperatures - May 2000

Date	Daily High Temp		Daily Low Temp		Record?	
	Observed	Diff from Norm	Observed	Diff from Norm	High	Low
01-May	-5.0	-23.0	-26.0	-35.0		*
02-May	5.0	-12.0	-4.0	-14.0		
03-May	15.0	-3.0	10.0	0.0		
04-May	18.5	1.5	12.0	2.0		
05-May	18.0	0.0	13.0	3.0		
06-May	23.0	6.0	16.0	5.0		
07-May	26.0	9.0	17.0	7.0		
08-May	30.0	12.0	19.0	9.0	*	
09-May	27.0	9.0	15.0	5.0		
10-May	25.5	7.5	13.0	3.0		
AVERAGE	16.5	0.5	8.4	-1.8		
MINIMUM	-5.0	-23.0	-26.0	-35.0		
MAXIMUM	30.0	12.0	19.0	9.0		
HISTORICAL	18.0	30.0	10.0	-25.0		
	Normal High	Record High	Normal Low	Record Low		

- Note 1: An alternative way to set borders (which gives you many more options) is to select the cells, then click on the **Format** menu, then select **Cells**, then click the **Border** tab.
- Note 2: If you don't want to bother adding borders you can get the gridlines to appear when you print a spreadsheet - on the **File** menu, click **Page Setup**, and then click the **Sheet** tab. Select the **Gridlines** check box. Warning - this gives you ALL of the gridlines on ALL of the cells on a page, and can make printing very slow.

## Cell Comments

- **Cell comments** are additional explanatory notes which you can attach to a cell in a spreadsheet.
- Cell C4 in the sample spreadsheet has a cell comment associated with it, as indicated by the small red triangle in the upper right corner of the cell.
- To view the comment, rest the pointer over the cell. A text box will appear, as shown below .

High Temp	Diff from Norm
-23.0	-12.0
-3.0	1.5
0.0	5.0
8.0	

**Column C:**  
 The difference between the observed high temperature for the day and the historical normal (average) high temperature for this date.  
 Negative numbers represent below normal temperatures, while positive numbers represent above normal temperatures.

- To add a comment to a cell, click the cell to which you want to add the comment.

# Excel Basics

- On the **Insert** menu, click **Comment**.
- In the box, type the comment text.
- When you finish typing the text, click outside the comment box.
- To edit an existing cell comment, click the cell with the comment you want to edit.
- On the **Insert** menu, click **Edit Comment**.

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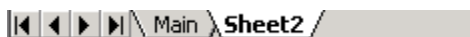
## Multiple Sheets

An Excel spreadsheet file is technically referred to as a **Workbook**, and can contain several individual spreadsheets called **Worksheets**. This feature allows you to organize various kinds of related information in a single Excel file. Up until now in this tutorial, we have been working with just one worksheet, the default first sheet named **Sheet1** which is displayed when you start a new Excel spreadsheet file.

- At the bottom of the Excel screen are **Sheet tabs**.



- To **move from sheet to sheet**, click the sheet tabs. If you click on Sheet2 or Sheet3 right now you will see that they are separate blank spreadsheets.
- If you are using a large number of sheets, you can use the **tab scrolling buttons** to the left of the sheet tabs to move the tabs display left or right.
- To **rename a sheet**, double-click the sheet name on the sheet tab, then type a new name over the current name.
- To **delete a sheet**, first select the sheet you want to delete, then on the **Edit** menu, click **Delete Sheet**.
- In the sample file you are creating, try renaming Sheet1 to Main and deleting Sheet3. Your sheet tabs should now look like:



- There are numerous other operations available for managing worksheets with an Excel workbook (e.g. move or copy sheets). For further information read the **Microsoft Excel Help / Contents / Working with Workbooks and Worksheets / Managing Worksheets**.

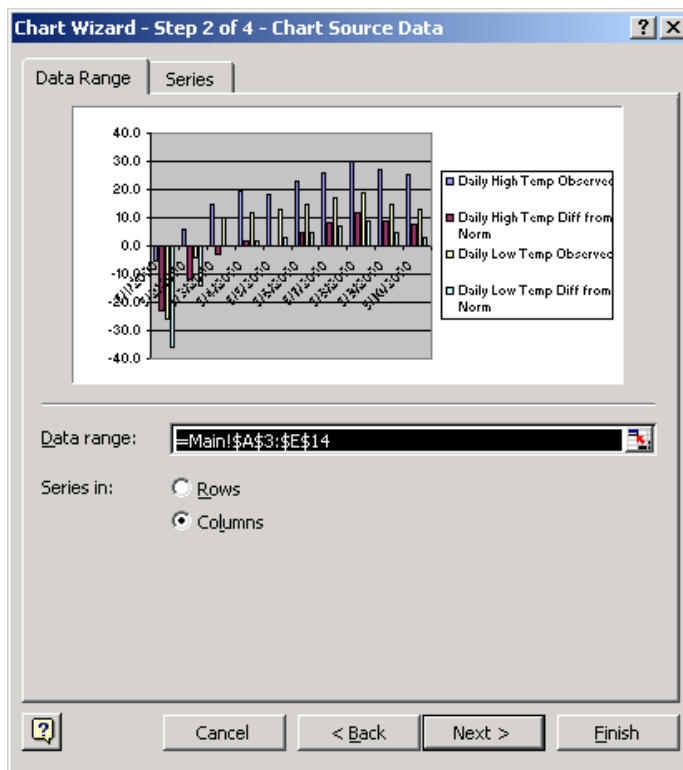
# Excel Basics

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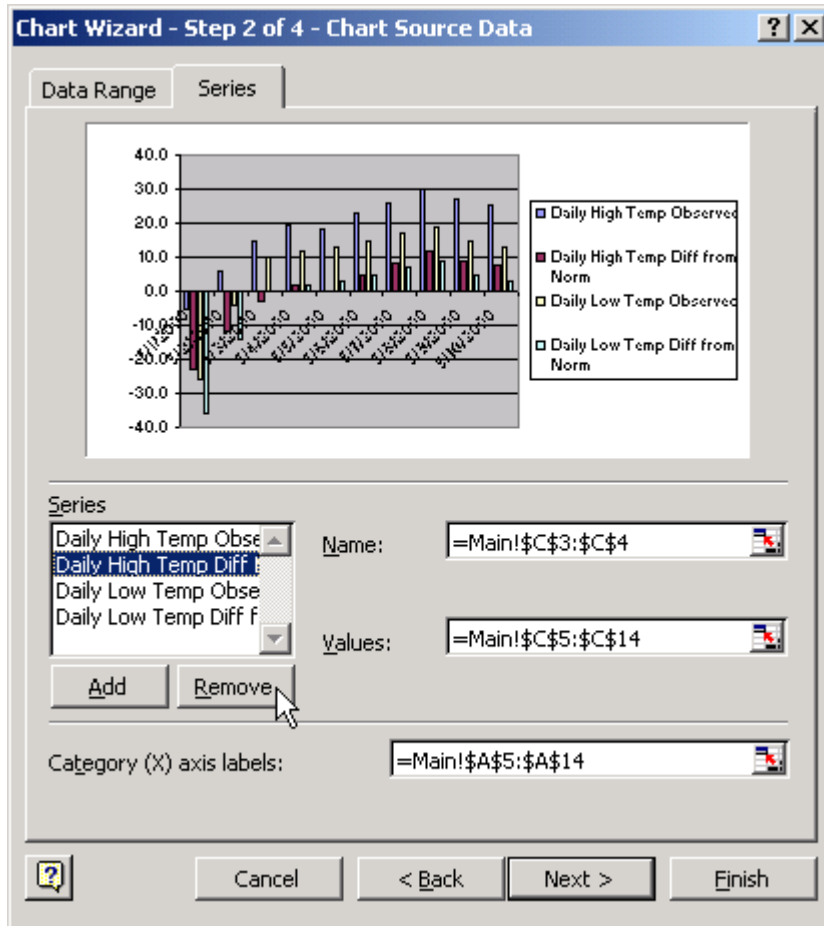
## Charts

In this section, we will add a chart to our sample spreadsheet workbook and store it on a new worksheet. The chart will provide a graphic representation of the high and low temperature data in the spreadsheet.

- Select the cells that contain the data that you want to appear in the chart. If you want column and row labels to appear in the chart, include the cells that contain them in the selection. In our sample, we should **highlight the block of cells A3 to E14**.
- Click the **Chart Wizard** button (or on the **Insert** menu click **Chart**).
- A window entitled **Chart Wizard - Step 1 of 4 - Chart Type** is displayed. There are many options available, but for our example we will just accept the default Column chart type displayed. Click the **Next** button.
- Step 2 of the chart wizard appears. The **Data Range** tab should appear as shown on the left below. Click on the **Series** tab to see some other options as shown on the right below. We will simplify the chart by only including the two Observed Temperature columns (not the two "diff" columns). Currently four series of data are listed in the Series box near the center left. Click on "Daily High Temp Diff ..." and click on the Remove button. Similarly, remove "Daily Low Temp Diff ...", then click the **Next** button.

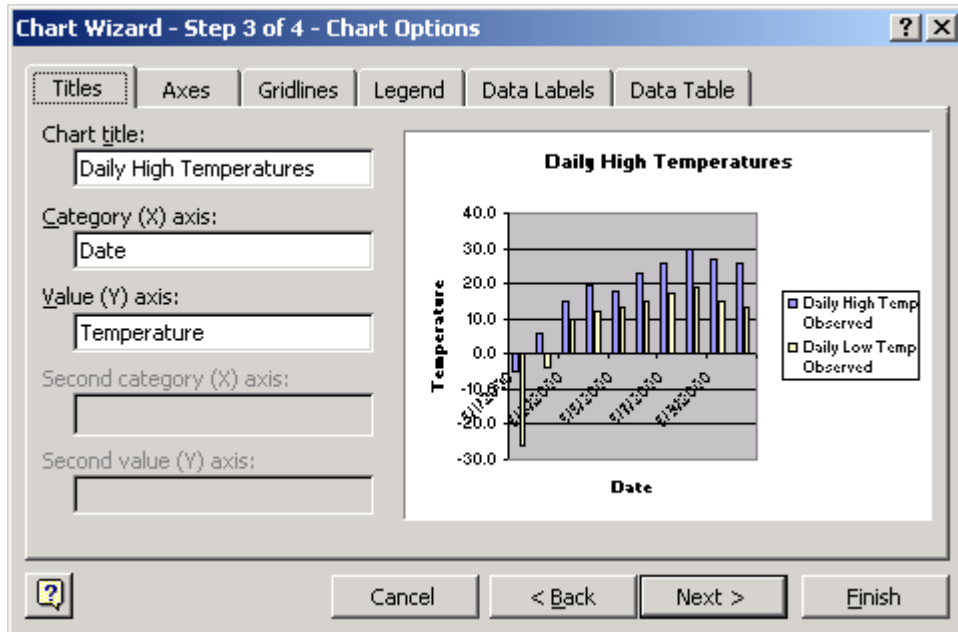


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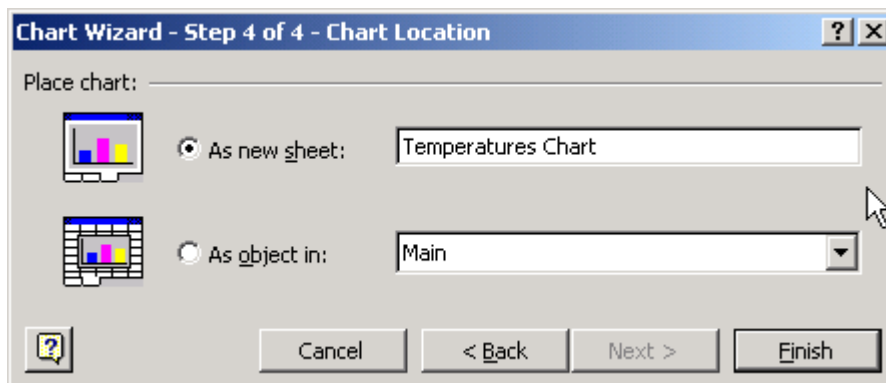


- Step 3 of the chart wizard appears. Set sensible **Titles** for the chart and axes as in the example below.

# Excel Basics

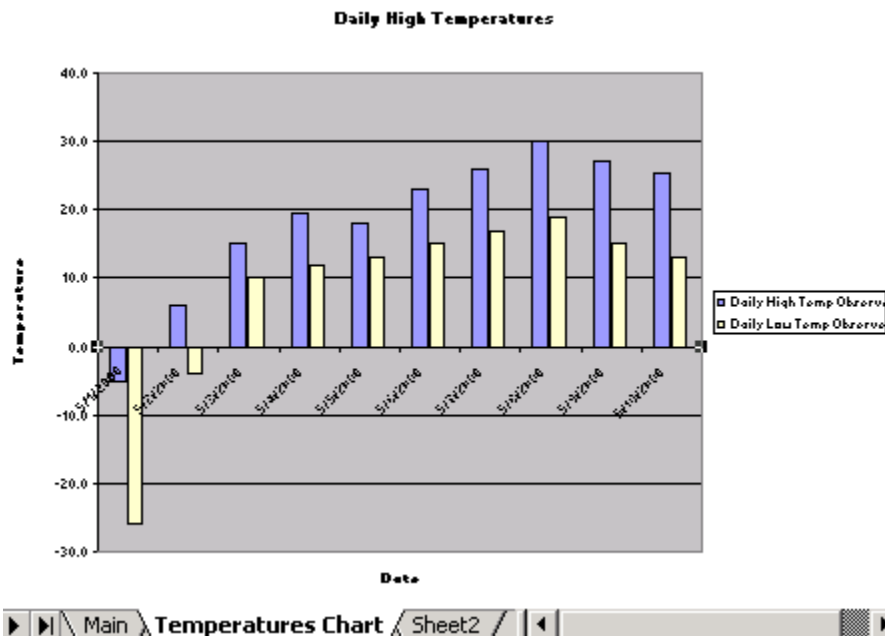


- Step 4 of the chart wizard appears. Select **As new sheet**, and enter a meaningful sheet name such as in the example below. Click **Finish**.

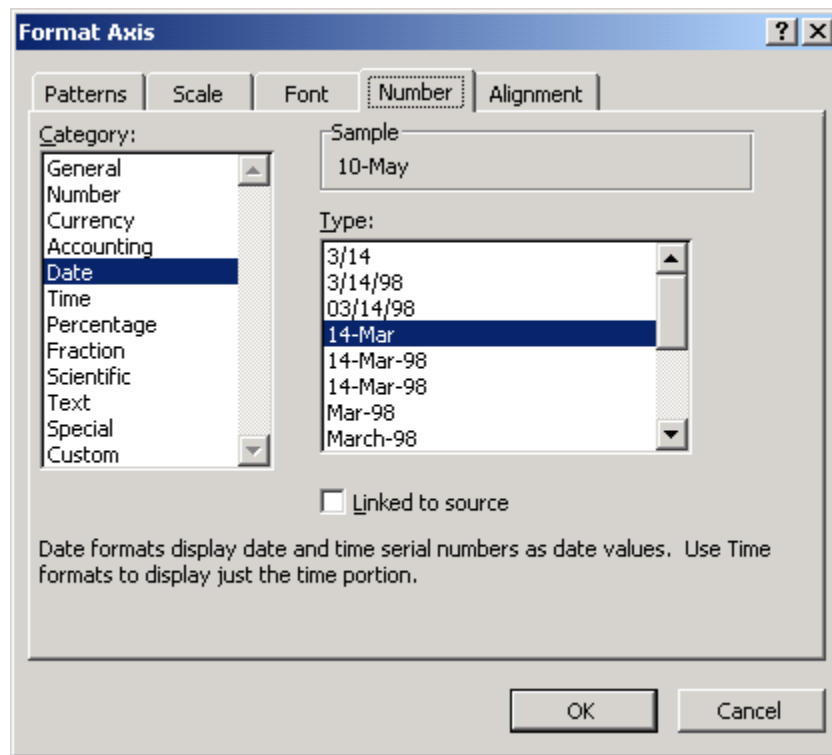


- The chart should appear in the workbook, similar to the example below. (Note: we moved the Temperatures Chart sheet to the right of the Main sheet, so that the Main sheet would still be the first sheet in the workbook - just drag-and-drop the Temperatures Chart tab to the right of the Main tab).

# Excel Basics



- If you wish to further customize any part of the chart, just double-click on it.
- For example, we changed the way the dates appear in the X-axis labels as follows:
  - Double-click anywhere among the dates displayed below the X-axis.
  - The **Format Axis** window appears. Set the options on the **Number** tab as shown below to display the dates as 10-May instead of 5/10/2000.



# Excel Basics


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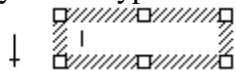
## Multimedia Tools

Many of the same commands for working with multimedia that are available in other Microsoft Office programs (Word, PowerPoint) are also available in Excel.

- For example, you can use familiar **Drawing Tools** in Excel by displaying the **Drawing Toolbar** - click on the **View** menu, then click **Toolbars**, then select **Drawing**.



- In our sample spreadsheet, we used a drawing tool to create a large text box near the bottom of the spreadsheet as follows.
  - Click on the **Text Box**  button in the drawing toolbar.
  - Put the mouse over the blank area below the occupied area of the spreadsheet
  - The cursor will change to a narrow down-arrow (as shown on the left below). Click, hold, drag, and release the mouse to form a rectangle on the sheet. Then you can type into the text box created for you (as shown on the right below).



- For further information on the following operations, please see our [PowerPoint tutorial](#).
  - To add a picture from an image file, click on **Insert / Picture / From File**.
  - To create a **WordArt** graphic out of text, click on the **Insert / Picture / WordArt**.
  - To insert **Clip Art**, click on **Insert / Picture / Clip Art**.
  - To create a bar or pie chart, on **Insert / Chart**.
  - To insert an organization chart, click on **Insert / Picture / Organization Chart**.
  - To insert other objects (e.g. movies, other documents), click on **Insert / Object**.

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## Sorting

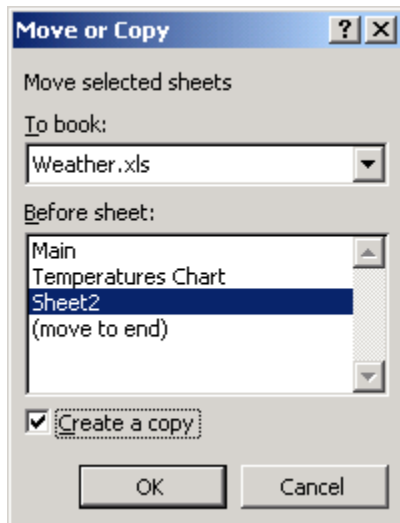
The data in a spreadsheet is sometimes more meaningful if it appears in a certain order. With the sorting tools in Excel, you can rearrange rows of data according to the contents of one or more columns. As an example of sorting, we will create a second copy of the Main worksheet and sort the data on the new sheet in a different order (you don't have to create a copy of data to sort it, we are just doing it for comparison sake).

To create a copy of the Main sheet:

- Select the Main sheet (formerly called Sheet1).
- On the **Edit** menu, click **Move or Copy Sheet** (or right-click the Main sheet tab and select **Move or Copy**).

# Excel Basics

- The **Move or Copy** window appears.
- Put a check mark beside **Create a Copy** and under **Before sheet:** indicate where the new sheet should be positioned, similar to the example below.



- **Note:** You can also use drag-and-drop to copy a sheet. Hold down the **Ctrl** key, drag the selected sheet tab to its new position among the sheet tabs, and release the mouse button before you release the **Ctrl** key.
- In our sample spreadsheet we **renamed** the copy from Main(2) to **Sort by High Temp**, you may want to do the same.

To sort the data on the new sheet:

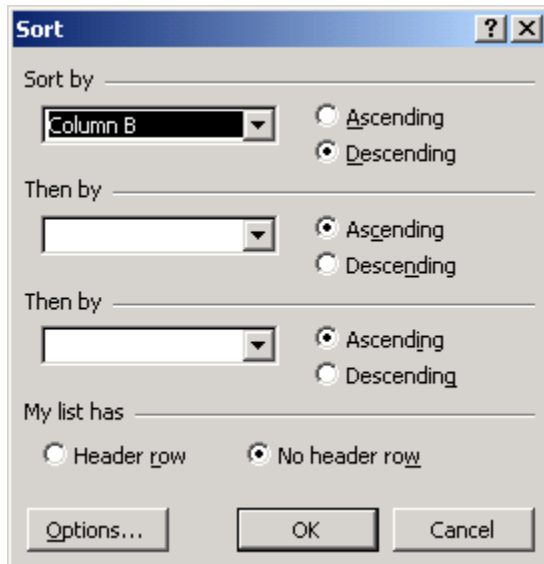
- First you must indicate what data in the spreadsheet is to be sorted.
- Select rows 5 to 14 on the **Sort by High Temp** worksheet as shown below (make sure to select the entire row so that all columns are included).

	A	B	C	D	E	F	G	H	I	J
1	Weather Watch - Daily Temperatures - May 2000									
2										
3	Date	Daily High Temp		Daily Low Temp		Record?				
4		Observed	Diff from Norm	Observed	Diff from Norm	High	Low			
5	1-May	-5.0	-23.0	-26.0	-36.0	*				
6	2-May	6.0	-12.0	-4.0	-14.0					
7	3-May	15.0	-3.0	10.0	0.0					
8	4-May	19.5	1.5	12.0	2.0					
9	5-May	18.0	0.0	13.0	3.0					
10	6-May	23.0	5.0	15.0	5.0					
11	7-May	26.0	8.0	17.0	7.0					
12	8-May	30.0	12.0	19.0	9.0	*				
13	9-May	27.0	9.0	15.0	5.0					
14	10-May	25.5	7.5	13.0	3.0					
15										
16	AVERAGE	18.5	0.5	8.4	-1.6					
17	MINIMUM	-5.0	-23.0	-26.0	-36.0					
18	MAXIMUM	30.0	12.0	19.0	9.0					
19										
20	HISTORICAL	18.0	30.0	10.0	-25.0					
21		Normal High	Record High	Normal Low	Record Low					

- On the **Data** menu, select **Sort**.
- The Sort options window appears. In this case, make sure to select **No header row**, because we did not select the labels in row 4 as part of our highlighted data rows. We will sort on **Column B** (observed daily high temperature) in **Descending** order (highest values

# Excel Basics

down to lowest values). Click **OK** to close this window.



- The selected rows should now appear in a different order as shown below. The date (8-May) with the largest Daily High appears first, on down to the date with the smallest Daily High. None of the data in rows 1 to 4, or 16 and beyond is altered. Nothing on any of the other sheets in the workbook is altered either.

3	Date	Daily High Temp		Daily Low Temp		Record?	
		Observed	Diff from Norm	Observed	Diff from Norm	High	Low
4							
5	8-May	30.0	12.0	19.0	9.0	*	
6	9-May	27.0	9.0	15.0	5.0		
7	7-May	26.0	8.0	17.0	7.0		
8	10-May	25.5	7.5	13.0	3.0		
9	6-May	23.0	5.0	15.0	5.0		
10	4-May	19.5	1.5	12.0	2.0		
11	5-May	18.0	0.0	13.0	3.0		
12	3-May	15.0	-3.0	10.0	0.0		
13	2-May	6.0	-12.0	-4.0	-14.0		
14	1-May	-5.0	-23.0	-26.0	-36.0		*
15							
16	<b>AVERAGE</b>	18.5	0.5	8.4	-1.6		
17	<b>MINIMUM</b>	-5.0	-23.0	-26.0	-36.0		
18	<b>MAXIMUM</b>	30.0	12.0	19.0	9.0		
19							
20	<b>HISTORICAL</b>	18.0	30.0	10.0	-25.0		
21		<b>Normal High</b>	<b>Record High</b>	<b>Normal Low</b>	<b>Record Low</b>		

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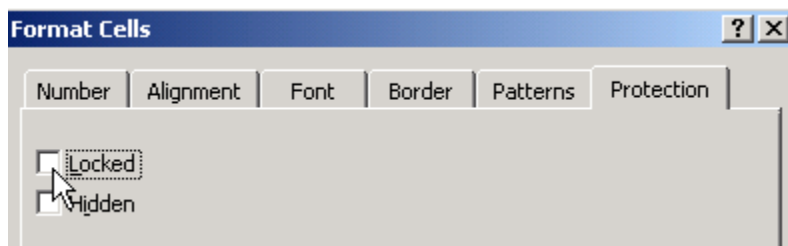
## Protection

# Excel Basics

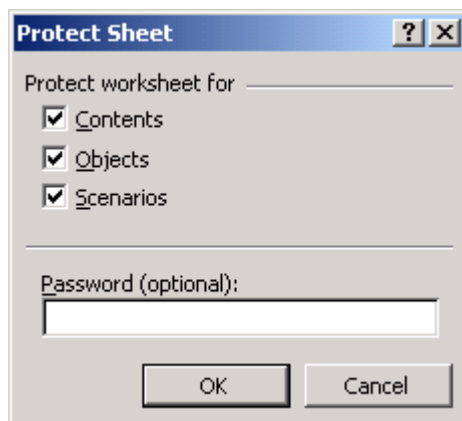
In Excel, you can set **Protection** options to prevent editing (or even viewing) of all or parts of a workbook. This can be very useful when you are sharing a spreadsheet with others or even to prevent yourself from accidentally altering labels, formulas, etc. once they are all completed.

In the following example, we will protect certain areas of the Main worksheet from unintentional changes.

- Switch to the Main worksheet, if it is not already displayed.
- In Excel, it is necessary to set an option to **unlock cells** that you still want to be able to change after a worksheet is protected. By default every cell has its **Locked property** set to true. In this example, let's say that we want to leave only the cells containing the high and low temperature raw data open for editing after we (eventually) protect the worksheet.
- Select the block of cells B5 to B14
- On the **Format** menu, select **Cells**.
- The **Format Cells** window appears. Click on the **Protection** tab. Click in the box next to **Locked** to remove the check mark. Click **OK**. You have now set the **Locked property** for these cells to false.



- Select the block of cells D5 to D14 and do the same as above to unlock them as well.
- On the **Tools** menu, point to **Protection**, and then click **Protect Sheet**.
- The **Protect Sheet** window appears. Just leave the options as they are and click **OK**.

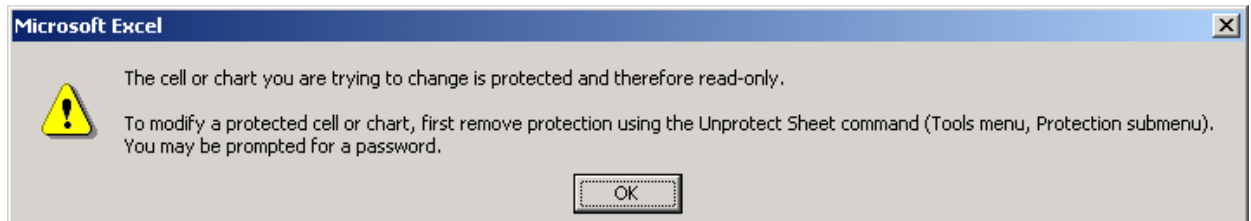


- This provides a casual level of protection. (If you were really more serious, for example if you wanted to prevent others from removing worksheet protection, you could set a

# Excel Basics

password. However, be aware that if you assign a password, and forget it, you yourself will not be able to alter the protected elements on the worksheet either.)

- If you have applied the protection options as per our instructions, you should see the message below if you try to alter the contents of any of the cells that remained **locked** on the Main sheet (for example try to alter cells B16, F3 or E20). You should however be able to modify the data in cells B5 to B14 or D5 to D14 (because you **unlocked** those cells).



- If you want to **change the Locked property** of cells, the worksheet must NOT be protected. Thus, once you have protected a sheet, you must unprotect it before you can modify the Locked settings.
- To **remove protection** from a worksheet, display the worksheet, then on the **Tools** menu, point to **Protection**, and then click **Unprotect Sheet**. If a password was set you will be prompted to enter the protection password for the worksheet. Passwords are case sensitive. You must type the password exactly as it was created, including uppercase and lowercase letters.
- **Note:** To move between unlocked cells on a protected worksheet, click an unlocked cell, and then press the **Tab** key. The **Tab** key is a handy way to let you cycle through the unlocked cells of a sheet.