# It's <u>Elementary</u>…
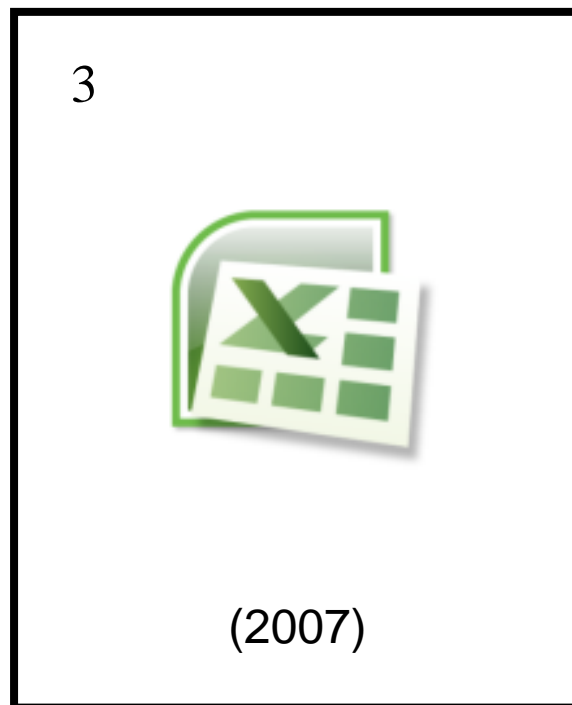
3

(2007)

# <u>Excel 2007</u>

**Applications for Microsoft Office Tools in the Classroom**
Don Carlin
CTE 629
[dhcarlin@interact.ccsd.net](mailto:dhcarlin@interact.ccsd.net)

**Description of the Element:** Excel is one of the fundamental elements for education. Microsoft Office Excel is a spreadsheet application written and distributed by Microsoft for Microsoft Windows and Mac OS X. It features calculation, graphing tools and more.

**Known Uses:** Organizing data, visualizing trends, making predictions, accounting, budgeting, charting/graphing, financial analysis, scientific applications. Spreadsheet help you manage data in various formats and can increase your productivity when dealing with various types of data. Computerized spreadsheets offer students and teachers a way to view data in various formats (pie charts, line graphs, bar graphs, and the like). When students and teachers are able to view data in visual formats, they are able to quickly see trends and make predictions.

**Isotopes:** Students are expected to make and interpret graphs as part of their content standards. Why not combine a technology standard and have the student construct and interpret charts that are real to them?

## Symbol:



## Nevada Technology Standards:

- ✓ Students demonstrate creative thinking, construct knowledge, and develop innovative products and process using technology.
- ✓ Students use digital media and environments to communicate and work collaboratively including at a distance, to support individual learning and contribute to the learning of others.
- ✓ Students apply digital tools to gather, evaluate, and use information.
- ✓ Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital toss and resources.

## Spreadsheet Terminology
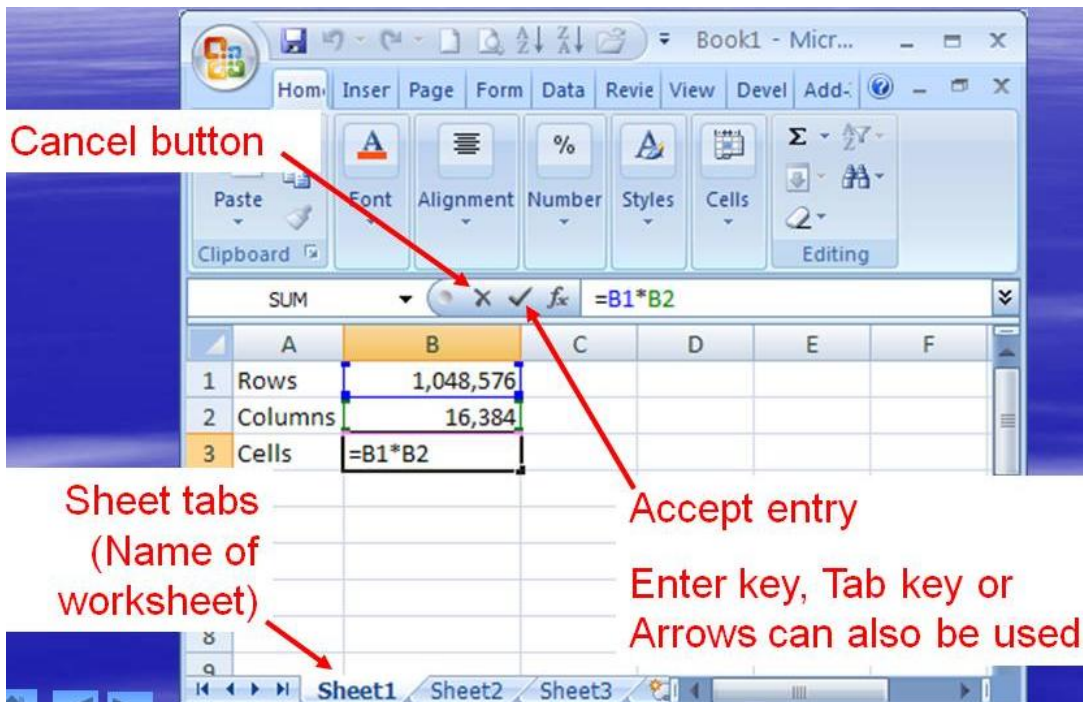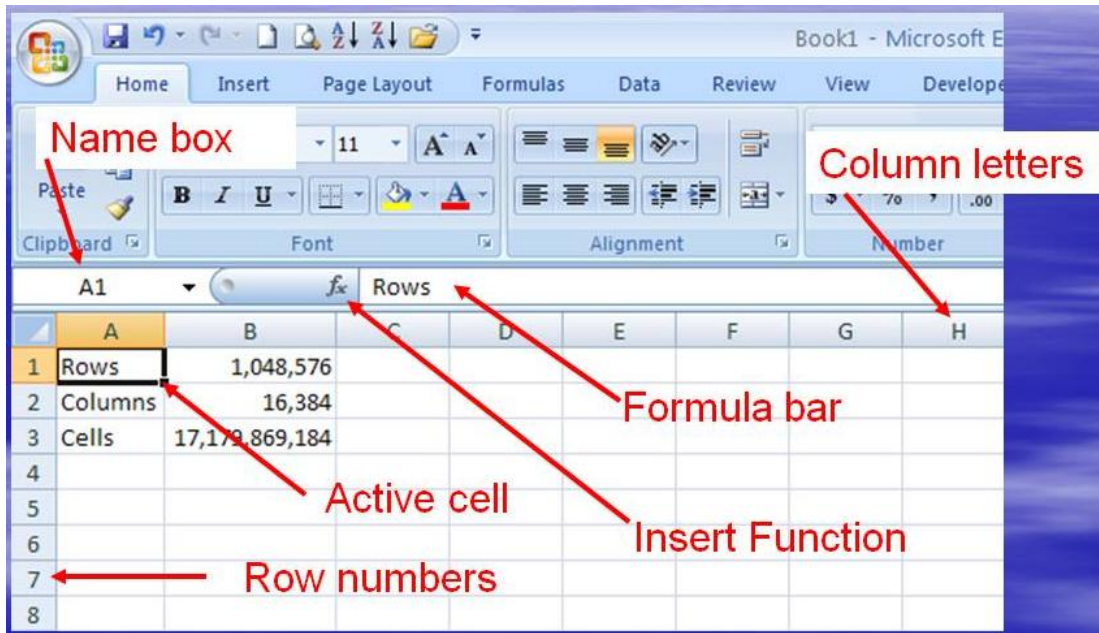
## My First Chart

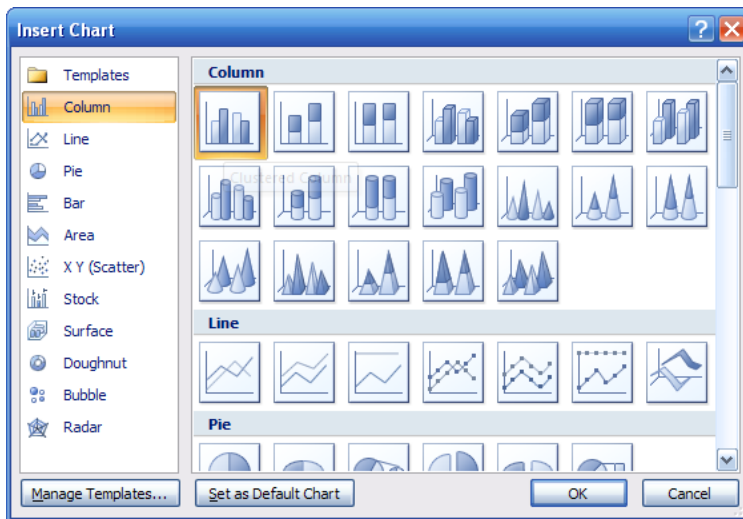Open the Excel worksheet *Water Drip Calculator* or copy the data table shown on the right into an Excel worksheet.

Highlight the two columns including the headings.

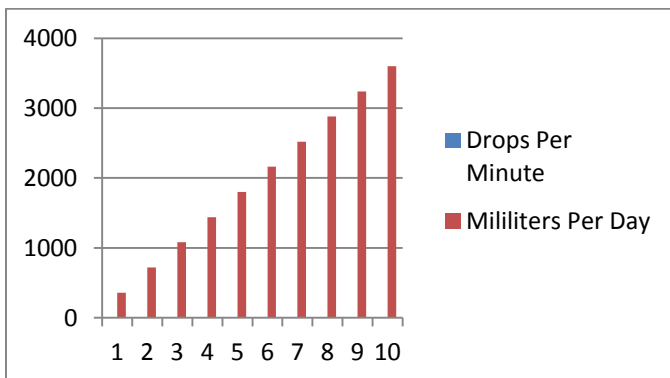Click the Insert Ribbon tab and Column icon.
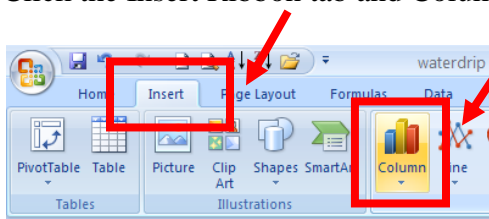
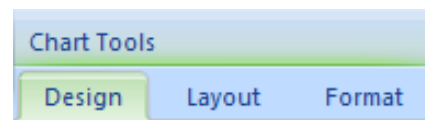| Drops Per Minute | Milliliters Per Day |
|---|---|
| 1 | 360 |
| 2 | 720 |
| 3 | 1080 |
| 4 | 1440 |
| 5 | 1800 |
| 6 | 2160 |
| 7 | 2520 |
| 8 | 2880 |
| 9 | 3240 |
| 10 | 3600 |

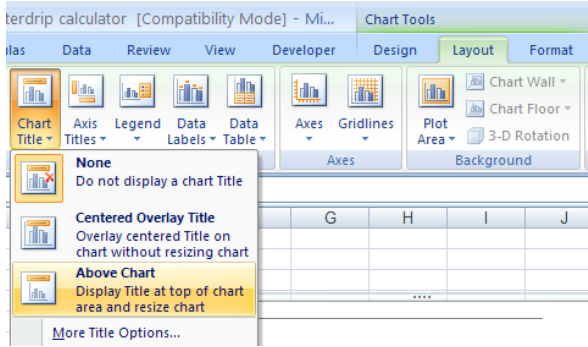Select the first Column choice then click OK.

You should have a chart similar to this chart.

With a little work, this will be one handsome chart!
Click on the chart to activate the Chart Tools Ribbon.

Select the Layout tab, Chart Title, and Above Chart.

The placeholder for the Title is now on the chart. Change the title to read "Amount of Water Lost from a Leaky Faucet". Your chart will be wider, but it should look similar to this.
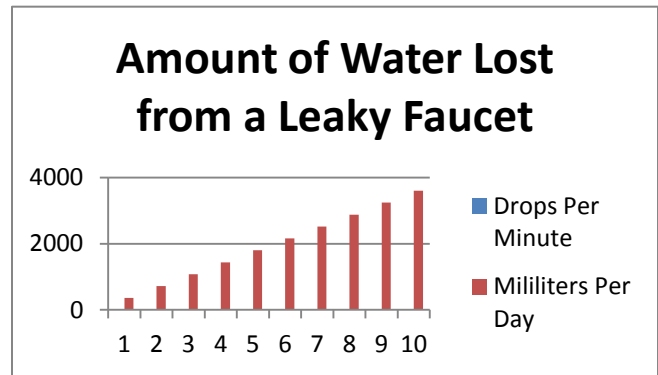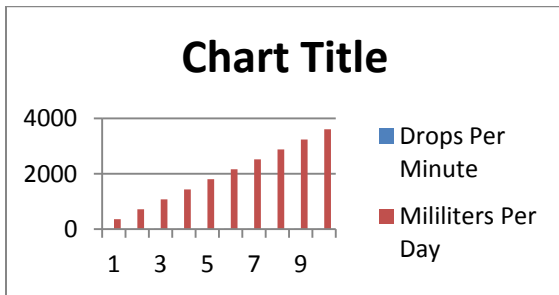
Select the Layout tab, Axis Titles, Primary Horizontal Axis Title, and Title Below Axis.
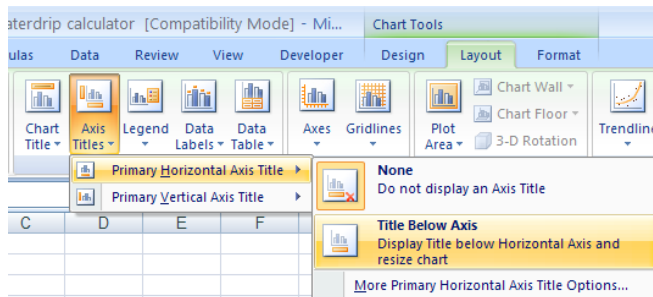
A new place holder appears for the X-axis title.

> Axis Title

Enter "Drops per Minute".

> Drops per Minute

Select the Layout tab, Axis Titles, Primary Vertical Axis Title, and Rotated Title.
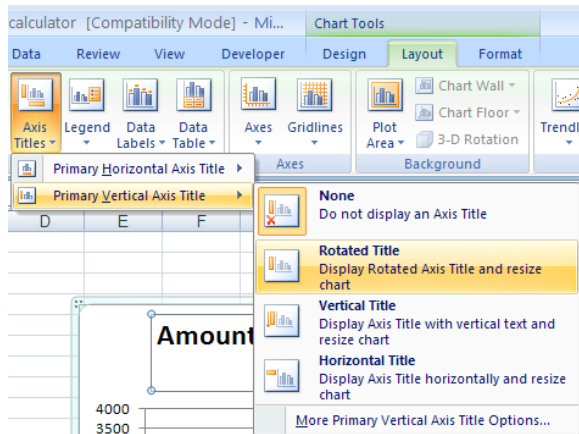
Enter "Milliliters Lost per Day"

Great! Now let's get rid of the legend. Click on the chart, Select the Legend tab then select None.
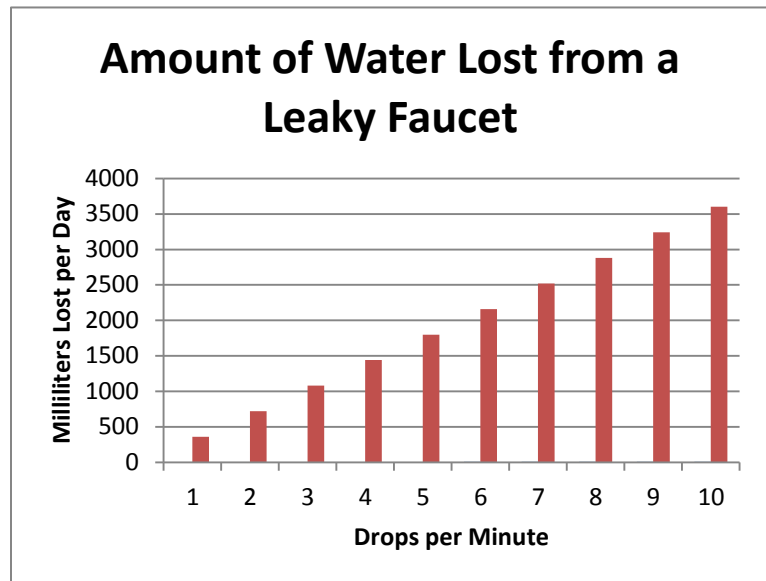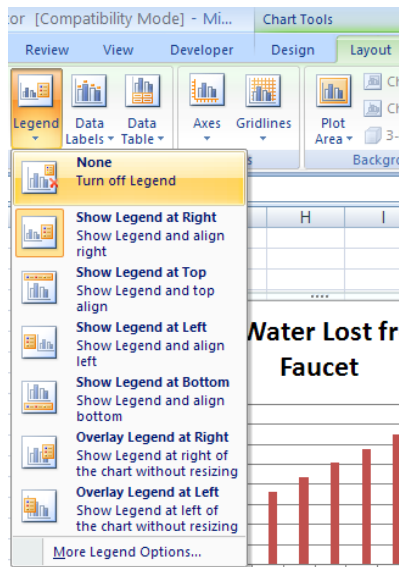
Your chart should look similar to the one shown above.

Let's add an image background for effect.

Click anywhere in the grid area of the chart. The area is selected when you see handles. Now, right click to see the Format Plot Area Menu.

From the new window, select Picture or texture fill. Next, select File and navigate to the image you want as a background.

Close this window and you are done.

Congratulations, you are done!
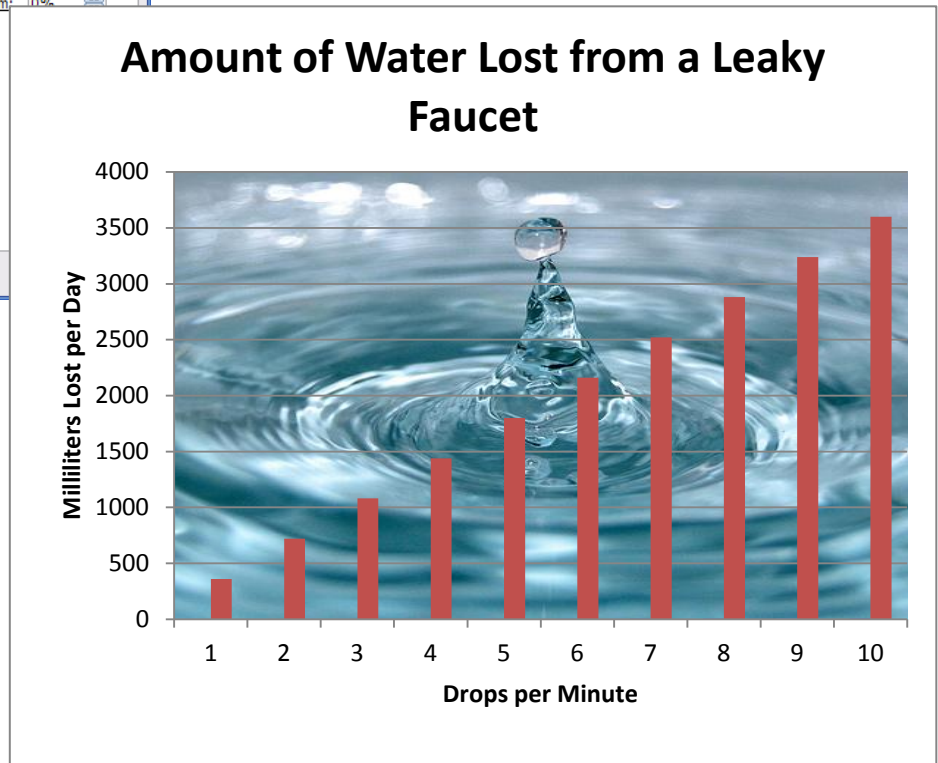
That's a handsome chart!

## More Chart Practice

Open the Excel document *Constructing Eight Types of Graphs*. Construct the eight types of graphs indicated by the tab sheet label.

Your graphs should look similar to those shown below. These charts may be distorted to fit in the space provided.

After completing the eight charts, copy the chart to a Word document and upload it the Excel Chart Forum.  See page 9.

## Monthly Household Expenses

**Columnar Graph**

## Selected US Exports Billions of Dollars

**Bar Graph**

## Five Top Trading Partners of the US Exports Percent

- Germany
- United Kingdom
- Mexico

50% · 5% · 5% · 9% · 11% · 20%

**Pie Chart**

## US Exports Amount in Dollars

**Line Graph**

## October Temperatures Temperature

$y = -0.8935x + 87.426$

**Scatter Chart**

## Volume of Landfill Waste Volume of Landfill Waste

- Organic Material
- Glass
- Metal

13% · 1% · 6% · 10% · 50% · 20%

**Donut**

| | |
|---|---|
| **Relative Size of Our Planets Compared to Earth** | **Profile of Sawtooth Mountain** |
| **Bubble Chart** | **Area Chart** |
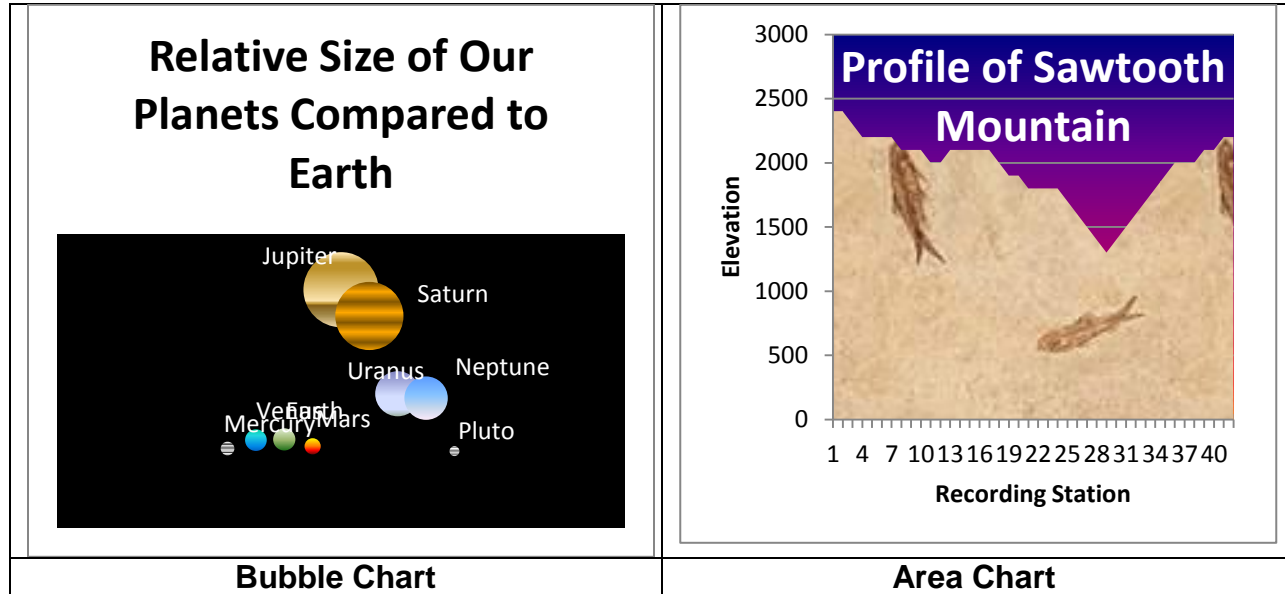
## Your Assignment

1. Open a Word document.
2. Put your name in the upper right-hand corner.
3. Below your name, type today's date.
4. Below today's date type the name of this assignment, Eight Types of Charts using Excel.
5. Below the title, type the name of each type of chart you created for this assignment and paste your chart. Including water drop calculator, you should have nine charts.
6. Save this document using the proper format, Your Name – Eight types of charts, and upload it to the Excel Chart Forum.

# Getting Started with Excel

Excel has many built-in functions that can be used to perform calculations on spreadsheet data. While most people use only those functions specific to their needs, there are many functions such as SUM, COUNT, COUNTIF, AVERAGE, MAX, MIN, ROUND and the IF function that just about everyone uses. Below are instructions for inserting these functions into a spreadsheet.

# Common Functions

## The SUM Function

1. Open a new spreadsheet. In cell A1 enter "Test Scores". In cells A2 through A9 enter these numbers: 45, 89, 78, 25, 62, 31, 54, 88.
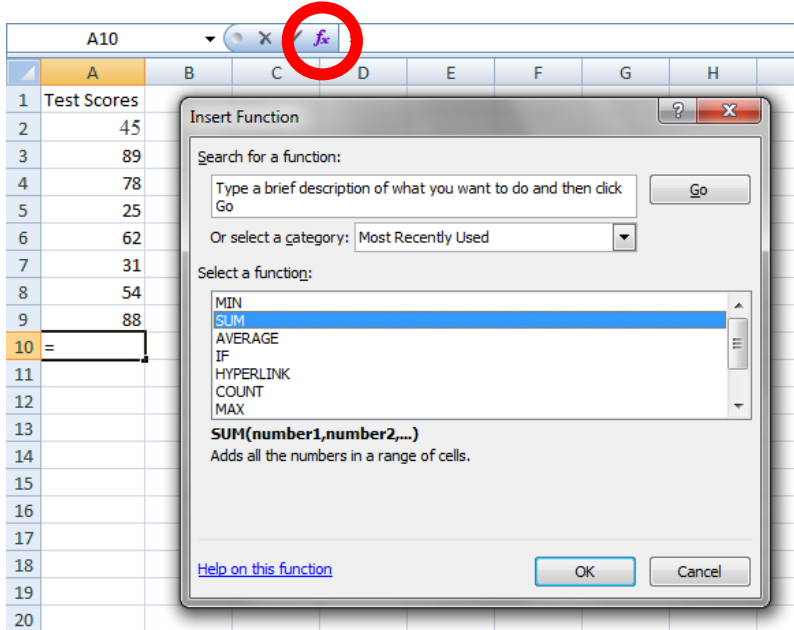
2. While in cell A10 click on the function button, $fx$.

Excel has dozens of built in functions. All you need to do is tell Excel which data to use.

3. Select the SUM. A new window opens.

Excel is assuming you want to add all the number in the unbroken list and defaults to A2:A9.
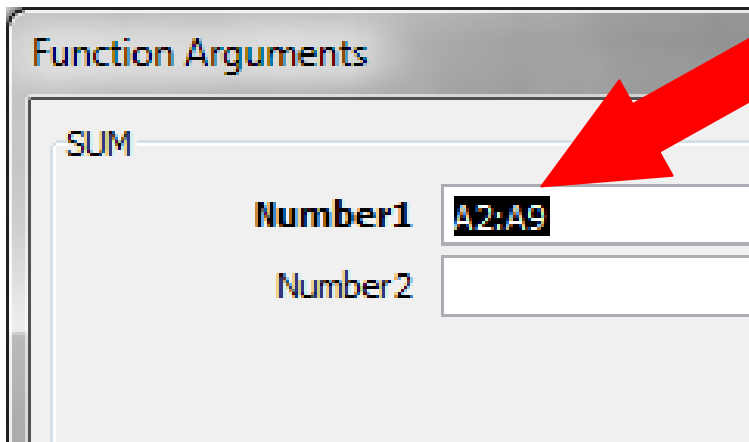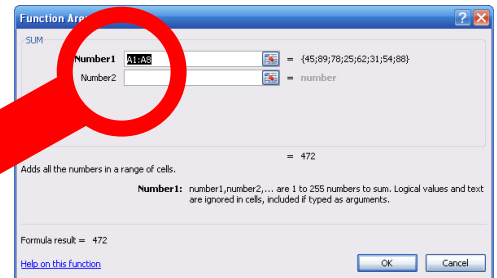
4. Click OK.

The results are shown in A10, 472.

| A10 | | | | $f_x$ | =SUM(A2:A9) |
|---|---|---|---|---|---|
| | A | B | C | D | E |
| 1 | Test Scores | | | | |
| 2 | 45 | | | | |
| 3 | 89 | | | | |
| 4 | 78 | | | | |
| 5 | 25 | | | | |
| 6 | 62 | | | | |
| 7 | 31 | | | | |
| 8 | 54 | | | | |
| 9 | 88 | | | | |
| 10 | 472 | | | | |

Look at the formula shown here. All Excel functions must begin with an equal sign, =. If you forget to start with an equal sign, Excel assumes you are entering text.

The function is very simple, SUM means add, but you can also do other operations using the SUM function. The argument is A2:A9. Start with the number in cell A2 and add all the numbers to cell A9. So the colon, :, means through.

Table of Contents

## The AVERAGE Function

The AVERAGE function will quickly find the average of a set of numbers.

1. Using the same set of numbers, click in cell A10 and hit the backspace key.
2. Click on the function button and select AVERAGE.
3. Click OK
4. As above, the new window shows the cells to average, A2:A9.  Click OK.

The average, 59, is displayed.

Notice the AVERAGE function is similar to the SUM function. Am I seeing a pattern?

## MINIMUM, MAXIMUM and MODE Functions

The statistical functions minimum, maximum, range, mean, and mode are frequently used by students. Students usually use paper and pencil, but could use a computer to learn to use spreadsheets.

1. Begin by adding two numbers to your list. In cell A10 enter 45 and cell A11 Enter 82. Whatever is inside a cell will be replaced when you enter something new.
2. In cell A13, enter Minimum Number is.
3. In cell A14 enter Maximum Number is.
4. In cell A15 enter Range is
5. In cell A16 enter Mode is
6. In cell A17 enter Mean is

| | A | B |
|---|---|---|
| 1 | Test Scores | |
| 2 | 45 | |
| 3 | 89 | |
| 4 | 78 | |
| 5 | 25 | |
| 6 | 62 | |
| 7 | 31 | |
| 8 | 54 | |
| 9 | 88 | |
| 10 | 45 | |
| 11 | 82 | |
| 12 | | |
| 13 | Minimum Number is | |
| 14 | Maximum Number is | |
| 15 | Range is | |
| 16 | Mode is | |
| 17 | Mean is | |

For this example I highlighted cells A13 through A17 and used right justification.

Notice , also, that column A is wider. Column widths can be adjusted in a number of ways, the easiest way is to move the cursor between column A and column B. When a double arrow appears,  ,click and drag column A to the desired width.
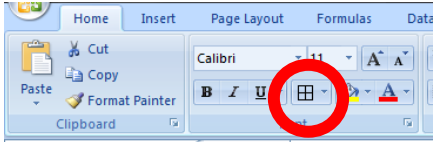
7. In Cell B 13 enter the function =MIN(A1:A10).
8. In Cell B 14 enter the function =MAX(A1:A10).
9. In Cell B 15 enter the function =A14-A13. (Range is the difference between the largest and smallest number in a set of numbers. A14 is the maximum number, A13 is the minimum number. This formula tells Excel to subtract A13 from A14.
10. In Cell B 16 enter the function =MODE(A1:A10).
11. In Cell B 14 enter the function =AVERAGE(A1:A10).

All of these functions can be found by clicking on the Function button, but they are easy enough to type.

As in Word, you can change font style, color and size. Borders are added using the circled border button.

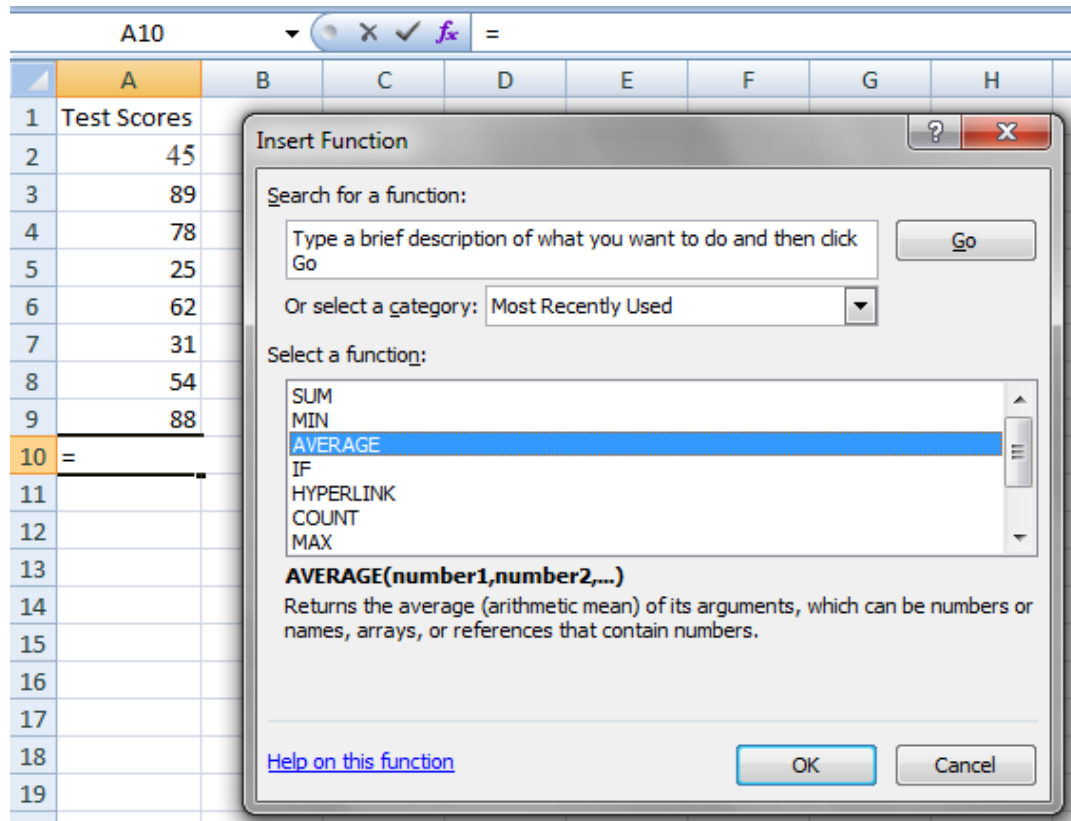| | A | B | C | D |
|---|---|---|---|---|
| 1 | Test Scores | | | |
| 2 | 45 | | | |
| 3 | 89 | | | |
| 4 | 78 | | | |
| 5 | 25 | | | |
| 6 | 62 | | | |
| 7 | 31 | | | |
| 8 | 54 | | | |
| 9 | 88 | | | |
| 10 | 45 | | | |
| 11 | 82 | | | |
| 12 | | | | |
| 13 | Minimum Number is | 25 | | |
| 14 | Maximum Number is | 89 | | |
| 15 | Range is | 64 | | |
| 16 | Mode is | 45 | | |
| 17 | Mean is | 59.9 | | |

# Educational Applications for Spreadsheets in the Classroom

Don Carlin – Touro University – dhcarlin@interact.ccsd.net

| | A | B |
|---|---|---|
| 1 | Test Scores | |
| 2 | 45 | |
| 3 | 89 | |
| 4 | 78 | |
| 5 | 25 | |
| 6 | 62 | |
| 7 | 31 | |
| 8 | 54 | |
| 9 | 88 | |
| 10 | 45 | |
| 11 | 82 | |
| 12 | | |
| 13 | Minimum Number is | =MIN(A2:A11) |
| 14 | Maximum Number is | =MAX(A2:A11) |
| 15 | Range is | =B14-B13 |
| 16 | Mode is | =MODE(A2:A11) |
| 17 | Mean is | =AVERAGE(A2:A11) |

To view the formulas in a spreadsheet, like those shown here, press Ctrl + tilde,

~ key. Don't press the shift key.

Table of Contents

## The COUNT Function

The COUNT function is useful when you need to count the number of items that meet a certain criteria. This example shows the number of cells that contain data.

1. Enter a numbers in cells A1 through A10, but skip a few cells.
2. In cell A11 type "Number of cells with data"
3. In cell B11 enter the formula =COUNT(A1:A10).

The results are displayed in cell B11.

## The IF Function

The IF function checks to see if a certain condition is true or false. If the condition is true, the function will do one thing, if the condition is false, the function will do something else.

The IF function we are using in this tutorial asks if the value in column A is greater than the value in column B. If it is, the IF function will place the statement "A is larger" in column C. If it is not, the IF function will place the statement "B is larger" in column C.

The first statement after the argument, A is larger, will be displayed if the statement is true. The second part, B is larger, will be displayed if the statement is false. Both parts must be included in the function.

| | A | B | C |
|---|---|---|---|
| 1 | 3 | 8 | =IF(A1>B1,"A is larger","B is larger") |
| 2 | 5 | 2 | =IF(A2>B2,"A is larger","B is larger") |

Our IF function will be entered into cell C1 and it looks like this:

The results are shown here.

| | A | B | C |
|---|---|---|---|
| 1 | 3 | 8 | B is larger |
| 2 | 5 | 2 | A is larger |

You could use any of these comparisons:
Equals (=)
Less than (<)
Less than or equal to (<=)
Greater than (>)
Greater than or equal to (>=)
Not equal to (<>)

Table of Contents

## The COUNTIF Function

The COUNTIF function is used to determine how many cells meet a certain condition. For example, the formula =COUNTIF(A1:A10,"A") determines how many cells contain the letter "A".  The COUNTIF function can include relational operators. For example, =COUNTIF(D1:D10"80").

Enter the set of letters and labels shown here.

1. In cell B12 enter =COUNTIF(A1:A10,"A")
2. In cell B13 enter =COUNTIF(A1:A10,"T")
3. In cell B14 enter =COUNTIF(A1:A10,"G")
4. In cell B15 enter =COUNTIF(A1:A10,"C")

5. Enter labels for the results in cells A12 through A15.

| | A | B |
|---|---|---|
| 1 | A | |
| 2 | T | |
| 3 | G | |
| 4 | A | |
| 5 | A | |
| 6 | T | |
| 7 | T | |
| 8 | C | |
| 9 | C | |
| 10 | A | |
| 11 | | |
| 12 | Number of A's | =COUNTIF(A1:A10,"A") |
| 13 | Number of T's | =COUNTIF(A1:A10,"T") |
| 14 | Number of G's | =COUNTIF(A1:A10,"G") |
| 15 | Number of C's | =COUNTIF(A1:A10,"C") |

Your results should look similar to those shown here.

| | A | B |
|---|---|---|
| 1 | A | |
| 2 | T | |
| 3 | G | |
| 4 | A | |
| 5 | A | |
| 6 | T | |
| 7 | T | |
| 8 | C | |
| 9 | C | |
| 10 | A | |
| 11 | | |
| 12 | Number of A's | 4 |
| 13 | Number of T's | 3 |
| 14 | Number of G's | 1 |
| 15 | Number of C's | 2 |

18

## The ROUND Function

The ROUND function changes the value by rounding it to a specific number of decimal places. The format for the ROUND function is =ROUND(argument,number of decimal places).  Where the first argument is the cell the value is contained may be found, and the second argument is the number of decimal places to which the results are to be rounded.  For example, =ROUND(B9,1) rounds the value stored in B9 to 1 decimal place.

Enter the information seen below in the appropriate cells. The average is 78.63636364.

**Notice: to round to the nearest tenths, hundredths etc. you must use a negative number, -1, -2, etc.**

| | A | B | C | D |
|---|---|---|---|---|
| 1 | 76 | | Rounded to the nearest whole number | =ROUND($A$12,0) |
| 2 | 86 | | Rounded to the nearest tenth | =ROUND($A$12,1) |
| 3 | 97 | | Rounded to the nearest hundredth | =ROUND($A$12,2) |
| 4 | 54 | | Rounded to the nearest thousandth | =ROUND($A$12,3) |
| 5 | 29 | | Rounded to the nearest ten thousandth | =ROUND($A$12,4) |
| 6 | 46 | | Rounded to the nearest hundred thousandth | =ROUND($A$12,5) |
| 7 | 96 | | Rounded to the nearest tens place | =ROUND($A$12,-1) |
| 8 | 145 | | Rounded to the nearest hundreds | =ROUND($A$12,-2) |
| 9 | 91 | | Rounded to the nearest thousands | =ROUND($A$12,-3) |
| 10 | 62 | | | |
| 11 | 83 | | | |
| 12 | =AVERAGE(A1:A11) | | | |

**Another NOTE: Notice $A$12 in the equations above. The dollar sign prevents the cells from changing when applying down fill (something we learn later).**

19

Your results should look similar to those shown here.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | 76 | | Rounded to the nearest whole number | 79 |
| 2 | 86 | | Rounded to the nearest tenth | 78.6 |
| 3 | 97 | | Rounded to the nearest hundredth | 78.64 |
| 4 | 54 | | Rounded to the nearest thousandth | 78.636 |
| 5 | 29 | | Rounded to the nearest ten thousandth | 78.6364 |
| 6 | 46 | | Rounded to the nearest hundred thousandth | 78.63636 |
| 7 | 96 | | Rounded to the nearest tens place | 80 |
| 8 | 145 | | Rounded to the nearest hundreds | 100 |
| 9 | 91 | | Rounded to the nearest thousands | 0 |
| 10 | 62 | | | |
| 11 | 83 | | | |
| 12 | 78.63636364 | | | |

Table of Contents
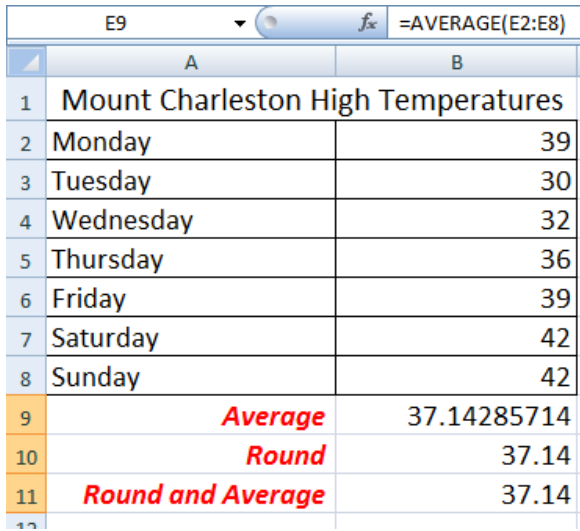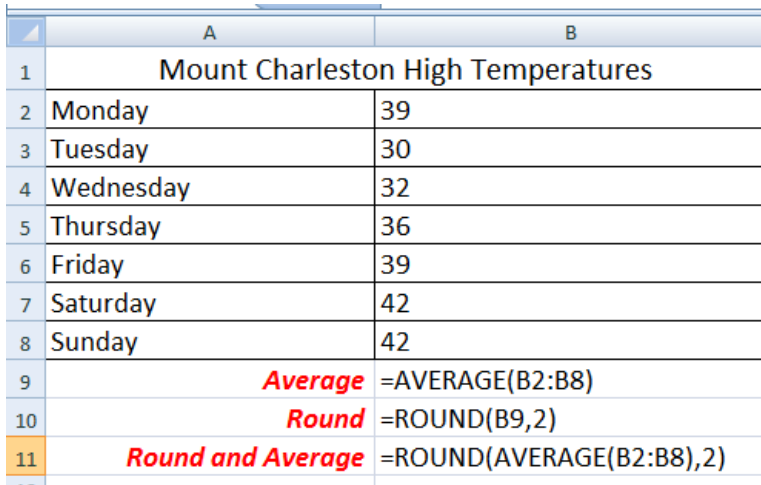
## Combining Functions

The activities above required two steps, firs find the average, second, round the average to the number of decimal places.  It is possible to combine the AVERAGE and ROUND functions into one function.  The format is =ROUND(AVERAGE(argument),number of decimal places).

In cell D10, enter the following formula: =ROUND(AVERAGE(B2:B8),2).  This formula will find the average and round it to the second decimal place all in one step.

|  | E9 | *fx* =AVERAGE(E2:E8) |
|---|---|---|
|  | **A** | **B** |
| 1 | Mount Charleston High Temperatures | |
| 2 | Monday | 39 |
| 3 | Tuesday | 30 |
| 4 | Wednesday | 32 |
| 5 | Thursday | 36 |
| 6 | Friday | 39 |
| 7 | Saturday | 42 |
| 8 | Sunday | 42 |
| 9 | *Average* | 37.14285714 |
| 10 | *Round* | 37.14 |
| 11 | *Round and Average* | 37.14 |

|  | **A** | **B** |
|---|---|---|
| 1 | Mount Charleston High Temperatures | |
| 2 | Monday | 39 |
| 3 | Tuesday | 30 |
| 4 | Wednesday | 32 |
| 5 | Thursday | 36 |
| 6 | Friday | 39 |
| 7 | Saturday | 42 |
| 8 | Sunday | 42 |
| 9 | *Average* | =AVERAGE(B2:B8) |
| 10 | *Round* | =ROUND(B9,2) |
| 11 | *Round and Average* | =ROUND(AVERAGE(B2:B8),2) |

## More Functions

Clicking on the Function Button or the Insert Menu and dragging to Function allows you to select from a variety of functions.  These functions are arranged by category, financial, statistics, date and time, and more.  Using function is often easier than trying to enter your own formula.
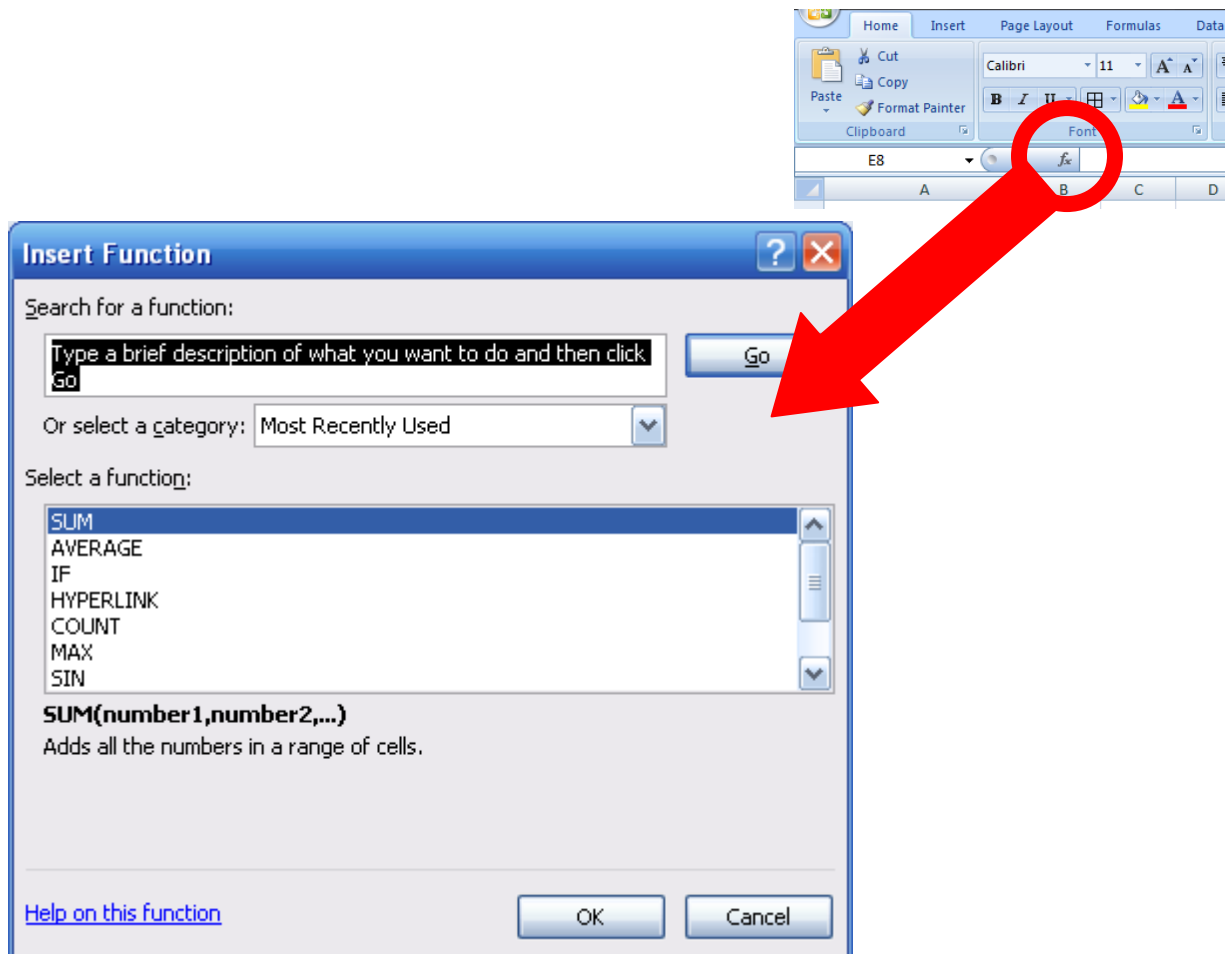
## Order of Operations – Rank has its privileges or first things first

As you know, the order in which mathematical operations are performed can give varied results depending on which operation gets done first or second.

| Formula | Resulting Value |
|---|---|
| =(3+5)*(8+7) | 120 |
| =3+5*8+7 | 50 |
| =6+2^2 | 10 |
| =(6+2)^2 | 64 |

When using formulas in spreadsheets, the computer will perform operations in order of parentheses, exponents, multiplication and addition unless the human interface is able to control the order. Hopefully, a quick review of the order of operations is all you need to be control the computer.

In the equation 3 + 4 X 5 you would get 23. However, if you added parentheses to the equation, (3 + 4) X 5 you would get 35; a pretty big difference.

The lowest order of operations is addition or subtraction, whichever operation is first in order from left to right.

For example:

$2 + 3 - 4 = ?$

First, add 2 + 3, which is 5.  Next, subtract, 5 – 4 = 1.      **$2 + 3 - 4 = 1$**

Why did you add first?  It came first going from left to right.

The next higher order of operation is multiplication or division, whichever operation comes first in order from left to right.

For example:

$12 \text{ x } 3 \div 6 = ?$

First, multiple 12 X 3, which is 36.  Next, divide, 36 ÷ 6 = 6.      **12 X 3 ÷ 6 = 6**

Why did you multiple first?  It came first in order from left to right.

The second highest order of operations is exponents or square roots, whichever comes first in order from left to right.

For example:      6 squared, 6^2 or $6^2$ - $\sqrt{25}$ = ?

First, square 6, which is 36.  Next, find the square root of 25, which is 5. Then subtract 25 from 36, which is 9.

Why did you find the square 6 first?  It came first in order from left to right.

**NOTE: In Excel, the symbol for multiplying is the asterisk, *, shift 8.**

**NOTE:  In Excel, exponents such as $6^2$, is written as 6^2, which means six to the power or two or six times six. 6^3 means six to the power of three or six times six times six. Press shift 6 for the caret. Also known as the hat!**

Did you notice there were actually three operations in this problem, the square of 6, the square root of 25, and subtraction?  Why did you subtract last?   Subtraction has the lowest rank in the order of operations.

The highest rank for the order of operations is the parentheses or brackets, ( ), [ ],  { }.

For example:

$[(5 + 7) \div 6] \times 2 =?$

First, add 5 and 7, which is 12.  Next, divide 12 by 6, which is 2.  Then, multiple 2 X 2, which is 4.  $[(5 + 7) \div 6] \times 2 = 4$

Why did you add first, when addition has the lowest rank?  Because, parentheses has the highest rank and 5 + 7 was inside the parentheses.

**To remember the order of operations, memorize this simple phrase:
The initials correspond to the order in which a mathematical expression is evaluated.**

**<u>P</u>lease
<u>E</u>xcuse
<u>M</u>y <u>D</u>ear
<u>A</u>unt <u>S</u>ally**

**<u>P</u>arenthesis
<u>E</u>xponents
<u>M</u>ultiply <u>D</u>ivide
<u>A</u>dd <u>S</u>ubtract**

Try these problems on paper.

1. $55 - 5 \times 6$ = a. 150 b. 25 c. 300

2. $6 \times 2^3$ = a. 36 b. 48 c. 1728

3. $17 + 16 \times 3 + 2$ = a. 67 b. 101 c. 170

4. $100/2 * 10 - 4$ = a. 494 b. 496 c. 300

5. $12 \times (3 + 4)$ = a. 84 b. 40 c. 5

6. $20 + 2 * 30/6 + 4$ = a. 17.33 b. 8 c. 34 d. 26

7. $(20 + 2 * 30)/6 + 4$ = a. 17.33 b. 8 c. 34 d. 26

8. $20 + 2 * 30/(6 + 4)$ = a. 17.33 b. 8 c. 34 d. 26

9. $(20 + 2 * 30)/(6 + 4)$ = a. 17.33 b. 8 c. 34 d. 26

10. $9 + 5(3 + 2 * 7)$ = a. 238 b. 219 c. 94

Answers: 1. b; 2. b; 3. a; 4. b; 5. a; 6. c; 7. a; 8. d; 9. b; 10. c;

## Order of Operations with Excel

**Remember: When using formulas in spreadsheets, it is necessary to use the equal sign (=) to start every equation. For example to add 4 + 9, you would enter =4+9 (no spaces between numbers and operation signs).**

# Educational Applications for Spreadsheets in the Classroom
Don Carlin – Touro University – dhcarlin@interact.ccsd.net

Solve each problem shown below in an Excel worksheet. Save the Excel document. (Remember to include your name in the file name)  Upload the file to Order of Operation Assignment folder.

1. $(2^3 + 5 \times 8)$

2. $(2 \times 6^3 + 63 \times 1^1 + 2)$

3. $(4 \div 1) \times 1$

4. $(6 \times 3) \times 7$

5. $(6 - 5^2) + 3^3 \times 2$

6. $(1 - 6 - 3)$

7. $5^2 + 9 + (2^2 \times 1^3 \times 5)$

8. $(7^2 \div 1 - 8) + 7^3 + 4$

9. $(9^2 - 3) + 9$

10. $(3^3 + 9) \times (1 + 9 - 2)$

11. $9 + 9 + (6^2 - 6) \times 4$

12. $5 - (3 - 3) + 6^3 \div 1$

13. $6 + 1 \times (9 - 4) + 6$

14. $(6 \div 6) \times (2^2 + 8) \div 1$

15. $(2^2 \times 4 \times 3)$

16. $(1^3 - 6) \div 5$

17. $(7 - 2^2 + 3)$

18. $4^3 \times (6 + 8) \div 1$

19. $4 \times (92 \div 6 \times 5)$
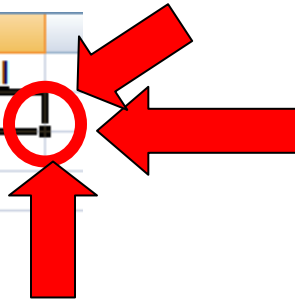
20. $(5 \times 82) + 9$

## Cell Reference and Absolute Cell Reference

1. Enter the labels and data shown below.
2. In cell D2 enter the formula =B2*C2 then press the Enter key.

The above formula multiplies ( * means multiply) the value of B2 times B3.  B2 and B3 are referred to as **cell references** when placed in an equation, (the place where data may be found in a formula or function).  The formula =B2*C2 contains two cell references, B2 and C2.

3. Now click back in cell D2.  Notice the handle in the lower right corner of the cell.

|   | A | B | C | D |
|---|---|---|---|---|
| 1 | **Item** | **Price** | **Quantity** | **Total** |
| 2 | 1001 | $1.75 | 25 | |
| 3 | 1023 | $5.69 | 37 | |
| 4 | 1876 | $3.50 | 19 | |

As you pass the pointer over the handle, it changes to a black cross.  ✚

4. When the pointer is a black cross, click the mouse and drag down two cells, D3 and D4.
5. Release the mouse.  You should see the products for cells B3*C3 and B4*C4.

Click in cell D3.  The formula in the formula bar should read =B3*C3.  How did this happen?

By selecting the fill pointer, the black cross, you instructed Excel to fill the cells below the selected cell, D2.  Excel assumes the columns will remain the same and the row number will increase.   This process is referred to as **down fill**.  The filling process will work going up, to the right or to the left.

Table of Contents

## Absolute Cell Reference

Open an Excel worksheet and enter the labels and data as shown below.
To find the shipping charge, multiply the shipping charge, B2, times the weight, cell C5.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Acme Shipping Rates | | | |
| 2 | Per Pound Charge | $1.75 | | |
| 3 | | | | |
| 4 | Customer | Order | Weight | Shipping Costs |
| 5 | Bob | Oranges | 25 | |
| 6 | Sue | Cherries | 5 | |
| 7 | Ted | Tomatoes | 20 | |
| 8 | Allice | Apples | 10 | |
| 9 | | | | |

1.  In cell D5 enter the formula =B2*C5 then press enter.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Acme Shipping Rates | | | |
| 2 | Per Pound Charge | $1.75 | | |
| 3 | | | | |
| 4 | Customer | Order | Weight | Shipping Costs |
| 5 | Bob | Oranges | 25 | $43.75 |
| 6 | Sue | Cherries | 5 | |
| 7 | Ted | Tomatoes | 20 | |
| 8 | Allice | Apples | 10 | |

2.  As above, use Auto Fill to enter the contents of cells D6 through D8. As you pass the pointer over the auto fill handle, it changes to a black cross. ✛ When the pointer is a black cross, click the mouse and drag down two cells, D3 and D4. Release the mouse. You should see the products for cells B3*C3 and B4*C4.

**OOPS! That's not what I wanted.**

| D6 | | $f_x$ | =B3*C6 | |
|---|---|---|---|---|

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Acme Shipping Rates | | | |
| 2 | Per Pound Charge | $1.75 | | |
| 3 | | | | |
| 4 | Customer | Order | Weight | Shipping Costs |
| 5 | Bob | Oranges | 25 | $43.75 |
| 6 | Sue | Cherries | 5 | $0.00 |
| 7 | Ted | Tomatoes | 20 | #VALUE! |
| 8 | Alice | Apples | 10 | #VALUE! |

Since Auto Fill assumes the cell changes to the next cell in the column, we get B3*C6, B4*C7, and B5*C8. Of course that's not what we meant. We meant to multiply B2 times C6, and B2 times C7. We need to tell Excel not to change B2.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Acme Shipping Rates | | | |
| 2 | Per Pound Charge | 1.75 | | |
| 3 | | | | |
| 4 | Customer | Order | Weight | Shipping Costs |
| 5 | Bob | Oranges | 25 | =B2*C5 |
| 6 | Sue | Cherries | 5 | =B3*C6 |
| 7 | Ted | Tomatoes | 20 | =B4*C7 |
| 8 | Alice | Apples | 10 | =B5*C8 |

To correctly reference our cell, we must use absolute cell reference. To do this, we put a dollar sign, $, in front of the column and row references, $B$2. This operation allows you to do an auto fill without changing the cell reference.

3. In cell D5, enter =$B$2*C5
4. Repeat the auto fill steps.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Acme Shipping Rates | | | |
| 2 | Per Pound Charge | $1.75 | | |
| 3 | | | | |
| 4 | Customer | Order | Weight | Shipping Costs |
| 5 | Bob | Oranges | 25 | $43.75 |
| 6 | Sue | Cherries | 5 | $8.75 |
| 7 | Ted | Tomatoes | 20 | $35.00 |
| 8 | Allice | Apples | 10 | $17.50 |

**Now, that's what I'm talking about!**

| D5 | | | fx | =$B$2*C5 |
|---|---|---|---|---|

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Acme Shipping Rates | | | |
| 2 | Per Pound Charge | 1.75 | | |
| 3 | | | | |
| 4 | Customer | Order | Weight | Shipping Costs |
| 5 | Bob | Oranges | 25 | =$B$2*C5 |
| 6 | Sue | Cherries | 5 | =$B$2*C6 |
| 7 | Ted | Tomatoes | 20 | =$B$2*C7 |
| 8 | Alice | Apples | 10 | =$B$2*C8 |

**Note: it is to make the row reference absolute and not the column or vice versa.**

**Note: An easier way to insert the $ signs in the formula is to place the cursor anywhere in the cell reference and press F4.**

## Creating a simple gradebook

1. Open Excel.
2. Click in cell A1 and enter **YOUR NAME'S Algebra Gradebook – First Quarter**. Don't worry if the title goes over the cell size, we'll take care of that later.
3. In cell A3 enter **Student Name**
4. In cells A4-A7 enter **Carter, Jimmy; Lincoln, Abe; Earhart, Amelia; Thatcher, Margaret**
5. In cell B3 enter **Pg 5**. In cell C3 enter **Pg 10**.
6. Highlight cells B3 and C3 by clicking in cell B3 and dragging to cell C3.
7. Grab the handle and continue dragging to cell E3. Cell D3 should have automatically filled with Pg 15 and cell E3 should contain the label Pg 20 (Auto fill to the right).
8. Enter Quiz 1 in cell F3
9. Enter the scores as shown below:

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Don Carlin's Algebra Gradebook for First Quarter (August 23 - October 22) | | | | | | | |
| 2 | | | | | | | | |
| 3 | Student N | Page 5 | Page 10 | Page 15 | Page 20 | Quiz 1 | | |
| 4 | Carter, Jin | 74 | 100 | 89 | 98 | 66 | | |
| 5 | Lincoln, A | 75 | 71 | 74 | 75 | 74 | | |
| 6 | Earhart, A | 71 | 70 | 85 | 65 | 93 | | |
| 7 | Thatcher, | 100 | 76 | 80 | 85 | 93 | | |
| 8 | | | | | | | | |

10. Save your gradebook using the name format "Your Name-Algebra gradebook".

Table of Contents

## Inserting Columns and Rows

Suppose you had a gradebook program such as your Algebra Gradebook. Everything was going along smoothly for your algebra class of four students until Garth arrived and you realized you forgot to include page 18 in the worksheet. Don't worry, you don't have to create a new spreadsheet, you can insert columns and rows. Open your Algebra Gradebook.

First, let's take care of Garth. He needs to go between Abraham and Amelia.

1. Click on row number 6, on the number 6; this will highlight the entire row and marks the insertion point. When you insert a new row, it will go on top of row 6.
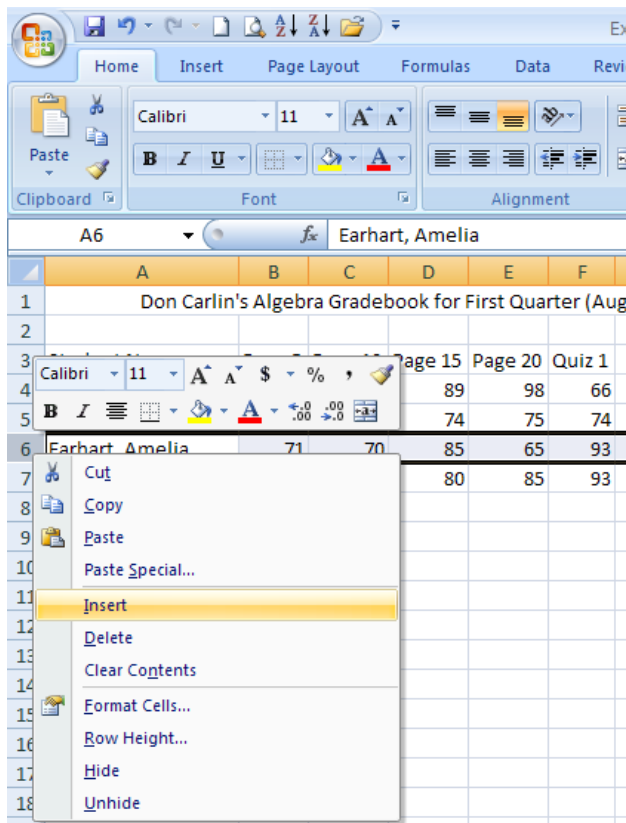
2. While the row is highlighted, right-click to open the menu. Select Insert.

3. In the new row, enter Brooks, Garth.

4. Enter Garth's scores. (Of course he made up all his work.) 56, 85, 75, 82, 67.

Now it is time to insert a column between columns D and E for the missing page 18 assignment.

1. Click on the column label E; this highlights the entire column. Right-click to open the drop-down menu. Select Insert.

You have room to enter page 18 and the scores. Of course everyone got a 100 on this assignment that's why you need to enter the scores.

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Don Carlin's | Algebra Gradebook-First Quarter | | | | |
| 2 | | | | | | |
| 3 | Student Nam | pg 5 | pg 10 | pg 15 | pg 20 | Quiz 1 |
| 4 | Carter, Jimm | 74 | 100 | 89 | 98 | 66 |
| 5 | Lincoln, Abe | 75 | 71 | 74 | 75 | 74 |
| 6 | Brooks, Gartl | 56 | 85 | 75 | 82 | 67 |
| 7 | Earheart, Am | 71 | 70 | 85 | 65 | 93 |
| 8 | Thatcher, Ma | 100 | 76 | 80 | 85 | 93 |
| 9 | | | | | | |

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | Don Carlin's Algebra Gradebook for First Quarter (August 23 - October 22) | | | | | | | |
| 2 | | | | | | | | | |
| 3 | Student Name | Page 5 | Page 10 | Page 15 | Page 18 | Page 20 | Quiz 1 | | |
| 4 | Carter, Jimmy | 74 | 100 | 89 | 100 | 98 | 66 | | |
| 5 | Lincoln, Abraham | 75 | 71 | 74 | 100 | 75 | 74 | | |
| 6 | Brooks, Garth | 56 | 85 | 75 | 100 | 82 | 67 | | |
| 7 | Earhart, Amelia | 71 | 70 | 85 | 100 | 65 | 93 | | |
| 8 | Thatcher, Margaret | 100 | 76 | 80 | 100 | 85 | 93 | | |

Your gradebook should look like the one above.

Table of Contents
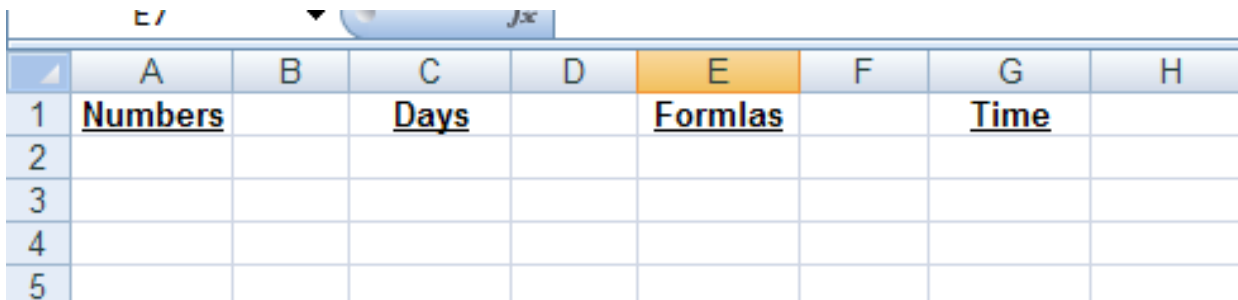
## Using Auto Fill

Once data has been entered into a cell, it is often necessary to repeat this data or to increase the data by a fixed increment. To do this, you need to use the Auto Fill command (Control D to down fill or Control R to right fill) or highlight the cell(s) and pull the pointer down or to the right to fill adjacent cells.

Using Ctrl-D or Ctrl-R copies the information from the parent cell to all selected cells. This is good if you want to copy the same information. Otherwise, learn to use the Auto Fill command.

Open the worksheet titled Using Auto Fill.



Enter 1 in cell A2 and 2 in Cell A3. Highlight the numbers 1 and 2 in column A. Place the pointer over the handle located in the lower-right corner, Illustration 2.
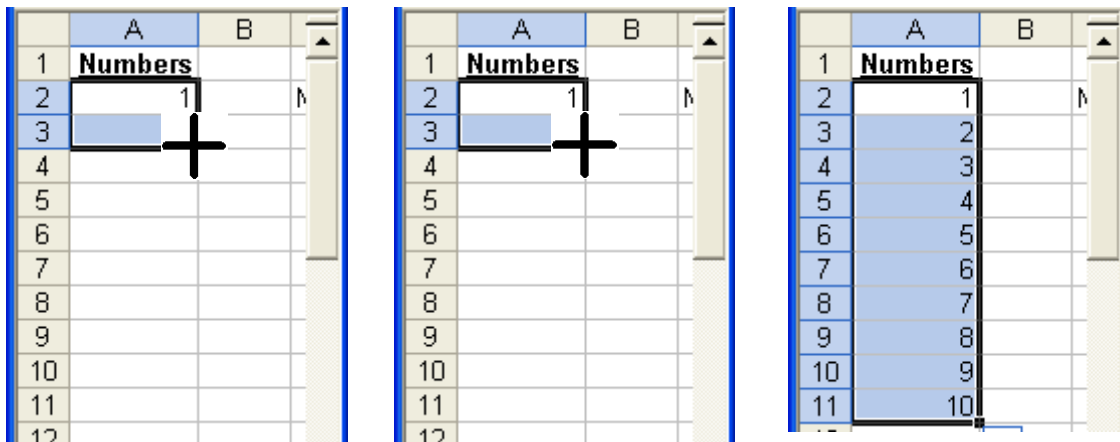


What happens if you only highlight cell A2 and do the down fill?

What happens if you only highlight cell A3 and down fill?

Why is it necessary to highlight both cells?

33

Highlight the cell containing the Label "Monday".  Drag the handle down until the cell contents is Sunday.  (The cells will not fill until you release the mouse button, but there is contents indicator just to the right of the pointer indicating the changes being made as you drag downwards.
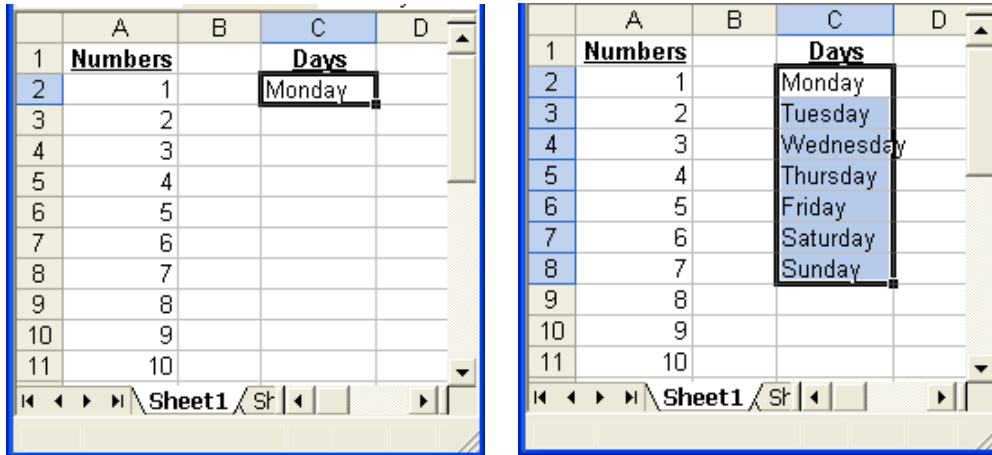


Notice the contents of cell A3 is a formula, =A2+1.  All formulas must begin with the equal sign (=).  This formula is starting with the contents of cell A2, which is 1, and adding 1 to this value.  The value stored in cell A3 would be 2, 1 + 1.
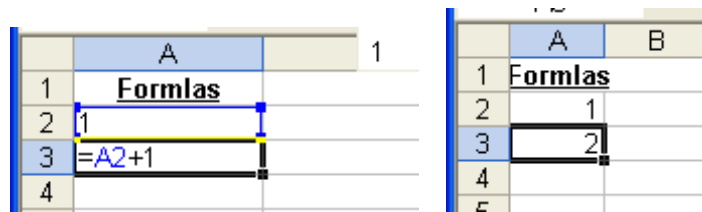


Dragging the handle down would increase the value of cell A4 to the value stored in cell A3, 2 by adding 1, thus the value of cell A4 would be 3, and so on.  We'll talk more about filling cells later.  Continue dragging the handle to cell A11.
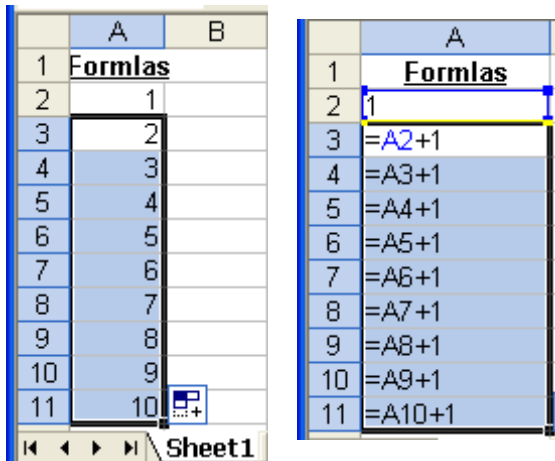


Study the example on the left to see how the formulas have changed during the down fill, the reference cell increased by one.

34

Time works the same way as the first example above.  Start with a time.  The next time should be the starting time, plus the interval with which you intend to increase each value.  For example, I started with 9:00 and want to increase each adjacent cell by 30 minutes.  The value stored in cell A3 is 9:30.

Highlight cells A2 and A3.  Drag the handle down to cell A10.  This gives me a value of 13:00 in cell A10.

| | A | B |
|---|---|---|
| 1 | **Time** | |
| 2 | 9:00 | |
| 3 | 9:30 | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |

Sum=18:30:00

| | A | B |
|---|---|---|
| 1 | **Time** | |
| 2 | 9:00 | |
| 3 | 9:30 | |
| 4 | 10:00 | |
| 5 | 10:30 | |
| 6 | 11:00 | |
| 7 | 11:30 | |
| 8 | 12:00 | |
| 9 | 12:30 | |
| 10 | 13:00 | |

Sum=99:00:00

Table of Contents

## Averaging Grades in your Algebra Gradebook

1. Open your Algebra gradebook.
2. Select cell H3. Enter "Average". In cell H4, enter the formula to calculate the average for Jimmy Carter. Hint: =AVERAGE(B4:G4).
3. Use down fill to calculate the grades for the rest of the class.

|   | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Don Carlin's Algebra Gradebook-First Quarter | | | | | | | |
| 2 | | | | | | | | |
| 3 | Student N | pg 5 | pg 10 | Page 18 | pg 15 | pg 20 | Quiz 1 | Average |
| 4 | Carter, Jin | 74 | 100 | 100 | 89 | 98 | 66 | 87.833333 |
| 5 | Lincoln, A | 75 | 71 | 100 | 74 | 75 | 74 | 78.166667 |
| 6 | Brooks, G | 56 | 85 | 100 | 75 | 82 | 67 | 77.5 |
| 7 | Earheart, | 71 | 70 | 100 | 85 | 65 | 93 | 80.666667 |
| 8 | Thatcher, | 100 | 76 | 100 | 80 | 85 | 93 | 89 |
| 9 | | | | | | | | |

Does your gradebook look like this?

## Headers, Footers and Print Preview

1. Open your algebra gradebook.
2. Go to **Page Layout** and select **Custom Margins**.
3. Set the top at 1.5", left and right at .75" and the bottom at 1".
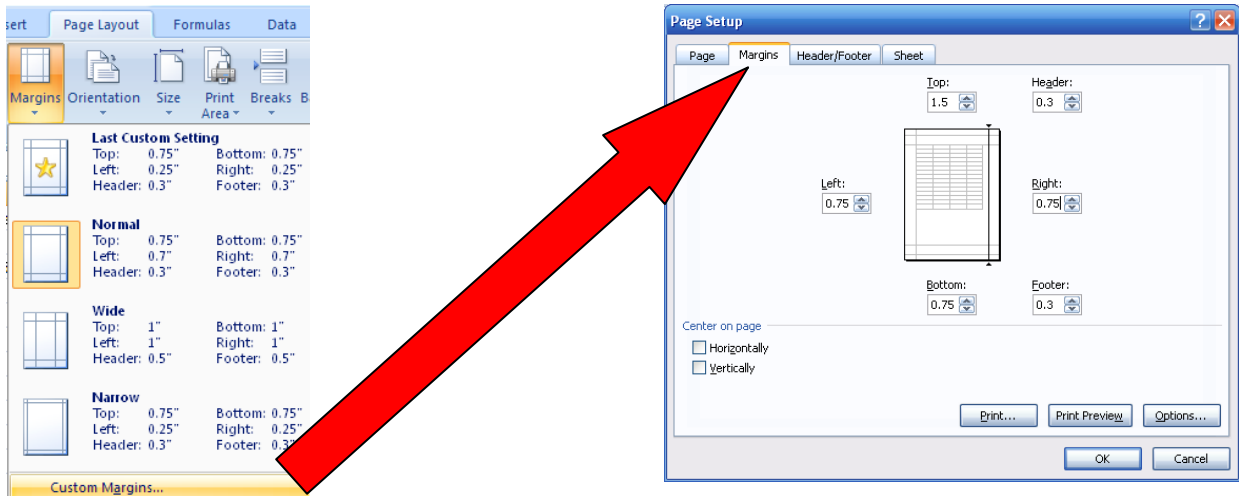
4. Select **Print Titles** and then select **Header and Footer**, **Custom Header, and Centered,** type your school name, class name, your name, and today's date.
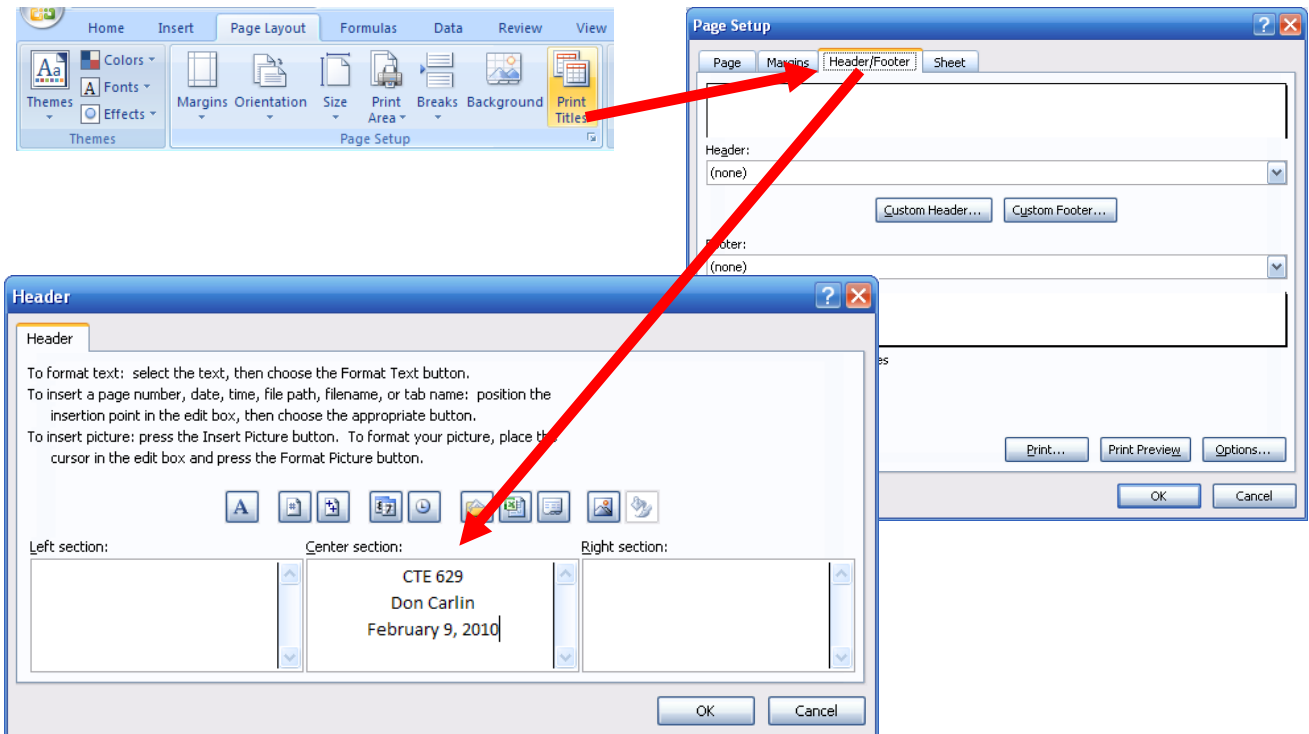
Your gradebook will have a custom header. Click in the Custom Footer to add a page number.

**It is a good idea to do a print preview before printing a spreadsheet.  It saves time and paper.**

Select Print Preview.  Your document should look like the one below.  While in Print Preview adjust the margins to make everything fit on one page.

CTE 629 Algebra
Don Carlin
September 22, 2011

Don Carlin's Algebra Gradebook-First Quarter

| Student Name | pg 5 | pg 10 | Page 18 | pg 15 | pg 20 | Quiz 1 | Average |
|---|---|---|---|---|---|---|---|
| Carter, Jimmy | 74 | 100 | 100 | 89 | 98 | 66 | 87.83333333 |
| Lincoln, Abe | 75 | 71 | 100 | 74 | 75 | 74 | 78.16666667 |
| Brooks, Garth | 56 | 85 | 100 | 75 | 82 | 67 | 77.5 |
| Earheart, Amelia | 71 | 70 | 100 | 85 | 65 | 93 | 80.66666667 |
| Thatcher, Margaret | 100 | 76 | 100 | 80 | 85 | 93 | 89 |

Your spreadsheet should look similar to this example.

1

Table of Contents

# Formatting Data

Let's get rid of all those decimals in the average scores.
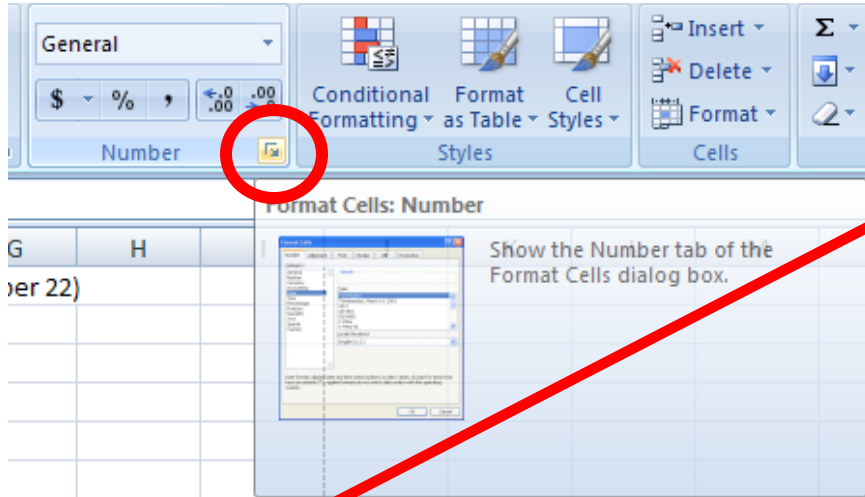


1. Open your gradebook.
2. Click on the letter H in the H column.
3. Select the expand selection button in the Number Ribbon.
4. Select the Number Tab and the Number Category.
5. Set the number of decimal places to 1.
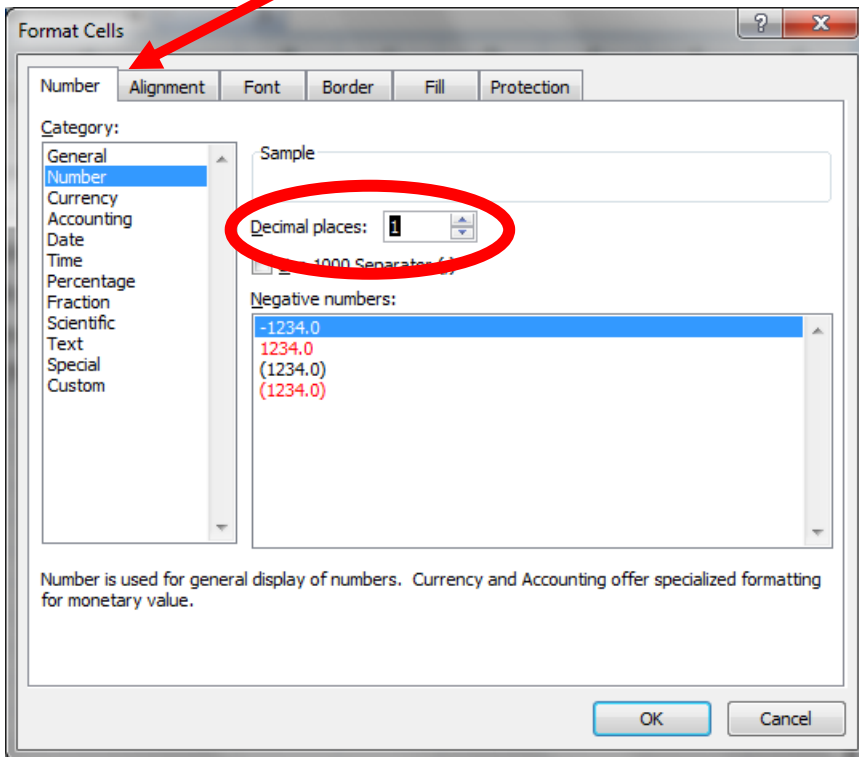


**The average grade now has one decimal place.**

Average
87.8
78.2
77.5
80.7
89.0

## Conditional Formatting

By applying Conditional Formatting, you can look at your gradebook and instantly tell if one of your students is in academic trouble.

1. To begin, highlight the data you want conditionally formatted. In this example, we will use average grades.
2. From the Home Tab, select the Conditional Formatting Ribbon.
3. Select Highlight Cells Rule.
4. Select Less Than…
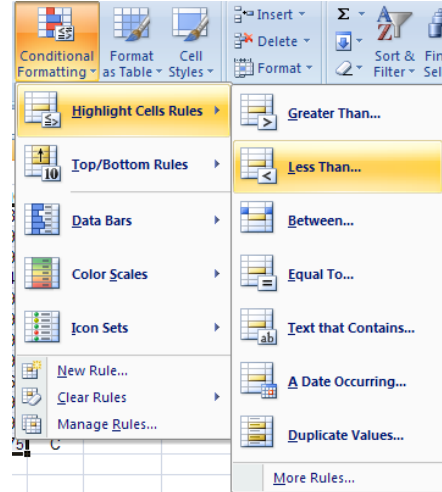


5. None of our students are in danger, let's set the rule to less than 80.
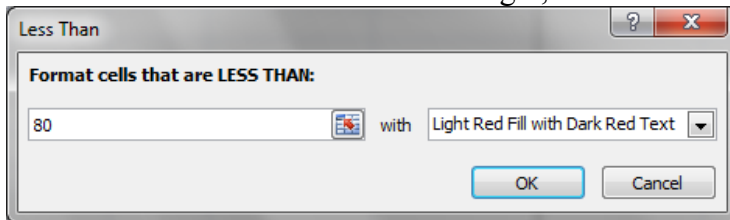


6. Leave the default color as Light Red Fill with Dark Red Text. This should get your attention.

We can also conditionally format the letter grades, or words or other numbers, but we will conditionally format grades lower than a C.  Excel assigns a value to letters, B is higher than A and C is higher than B, and so on.
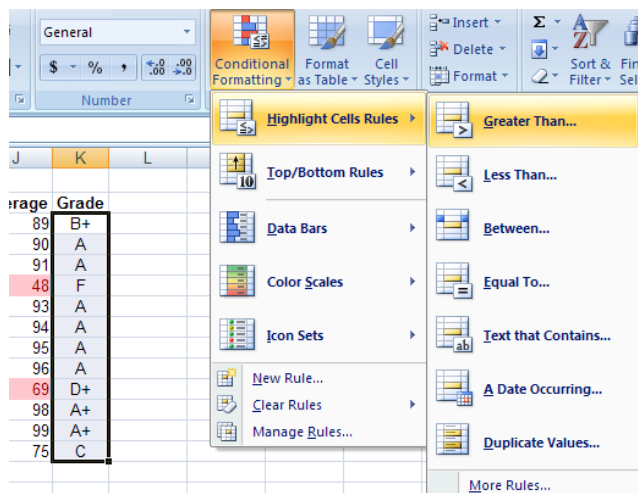


7. Again, highlight the data you want conditionally formatted, averages.
8. Select Conditional Formatting from the Home Ribbon.
9. Select Greater Than…
10. Enter Greater Than 88.9.
11. Select Green Fill
12. Press OK.

**Greater Than**

**Format cells that are GREATER THAN:**

88.9    with    Green Fill with Dark Green Text

OK    Cancel
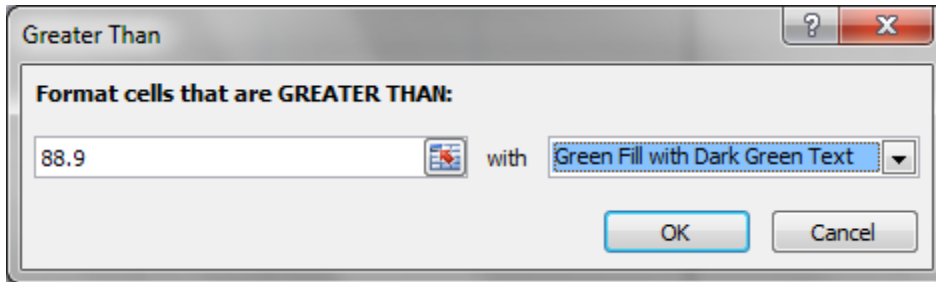
| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Don Carlin's Algebra Gradebook-First Quarter | | | | | | | |
| 2 | | | | | | | | |
| 3 | Student Name | pg 5 | pg 10 | Page 18 | pg 15 | pg 20 | Quiz 1 | Average |
| 4 | Carter, Jimmy | 74 | 100 | 100 | 89 | 98 | 66 | 87.8 |
| 5 | Lincoln, Abe | 75 | 71 | 100 | 74 | 75 | 74 | 78.2 |
| 6 | Brooks, Garth | 56 | 85 | 100 | 75 | 82 | 67 | 77.5 |
| 7 | Earheart, Amelia | 71 | 70 | 100 | 85 | 65 | 93 | 80.7 |
| 8 | Thatcher, Margaret | 100 | 76 | 100 | 80 | 85 | 93 | 89.0 |

How's that? Now you know who to watch and who to praise.

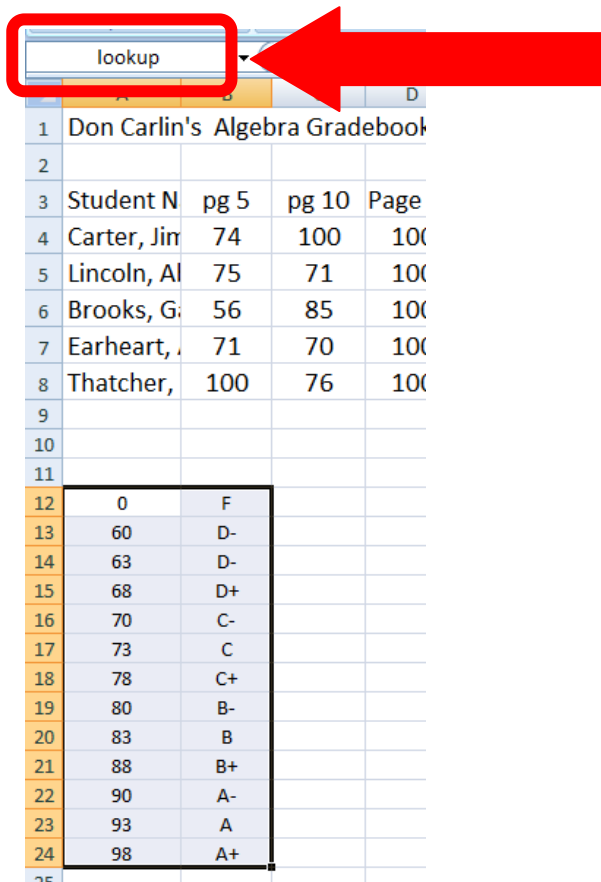Table of Contents

## VLOOKUP Tables

A vertical lookup table is able to return an assigned value based on a set of criteria. In this case, the lookup table will return a letter grade based on the student's average.

VLOOKUP tables, like the table in A12:B24 are in ascending order.

1. Create the lookup table; Starting in Cell A12 enter the numbers shown on the right.
2. Highlight the entire table; Cells A12 through B24.
3. Go to the Name box and name the table, lookup.

   **It is important that you have highlighted all the cells in what will be the lookup table.**

|    |    |    |
|----|----|----|
| 11 |    |    |
| 12 | 0  | F  |
| 13 | 60 | D- |
| 14 | 63 | D- |
| 15 | 68 | D+ |
| 16 | 70 | C- |
| 17 | 73 | C  |
| 18 | 78 | C+ |
| 19 | 80 | B- |
| 20 | 83 | B  |
| 21 | 88 | B+ |
| 22 | 90 | A- |
| 23 | 93 | A  |
| 24 | 98 | A+ |
| 25 |    |    |

lookup

|    | A | B | C | D |
|----|---|---|---|---|
| 1  | Don Carlin's Algebra Gradebook | | | |
| 2  |   |   |   |   |
| 3  | Student N | pg 5 | pg 10 | Page |
| 4  | Carter, Jim | 74 | 100 | 100 |
| 5  | Lincoln, Al | 75 | 71 | 100 |
| 6  | Brooks, G: | 56 | 85 | 100 |
| 7  | Earheart, . | 71 | 70 | 100 |
| 8  | Thatcher, | 100 | 76 | 100 |
| 9  |   |   |   |   |
| 10 |   |   |   |   |
| 11 |   |   |   |   |
| 12 | 0  | F  |   |   |
| 13 | 60 | D- |   |   |
| 14 | 63 | D- |   |   |
| 15 | 68 | D+ |   |   |
| 16 | 70 | C- |   |   |
| 17 | 73 | C  |   |   |
| 18 | 78 | C+ |   |   |
| 19 | 80 | B- |   |   |
| 20 | 83 | B  |   |   |
| 21 | 88 | B+ |   |   |
| 22 | 90 | A- |   |   |
| 23 | 93 | A  |   |   |
| 24 | 98 | A+ |   |   |
| 25 |   |   |   |   |

4. In cell I3 enter the label "Grade".
5. In cell I4 enter the formula:  =VLOOKUP(H4,lookup,2).
6. If a letter grade of B is returned, down fill the remainder of the column.

VLOOKUP tells the computer it will be using a vertical lookup table.  H4 is cell where the value can be found, in this example, 87.8%.  "lookup" is the name of the table to look for the value to be returned. 2 is the column from where the value will be returned, B in this example.

# Other Helpful Excel Tricks

## Vertical Alignment

Sometimes it is necessary to align labels vertically or column width becomes too wide to manage.  Labels may be aligned vertically to conserve space and to make the worksheet more attractive.

1. Enter the following information in a worksheet.

| Student | Tale of Two Cities | Light in the Forest | The Outsiders | Red Badge of Courage | Twilight |
|---|---|---|---|---|---|
| Mohammad | | | | | |
| Christine | | | | | |
| Khateja | | | | | |
| Bob | | | | | |
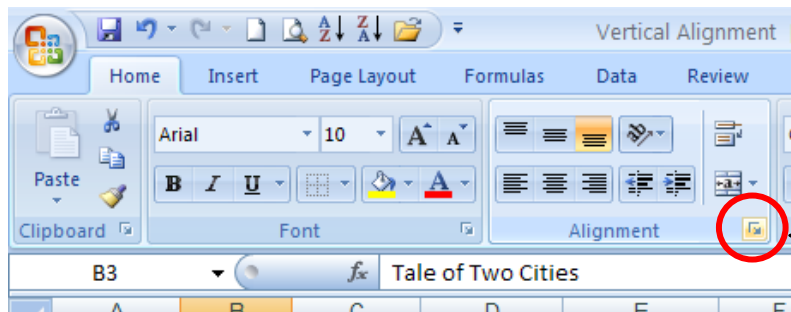


2. Place the cursor in the cell that contains the label, Tale of Two Cities. From the Home Ribbon select the align icon. The window shown below will open.

3. Click and drag the Red dot on the Orientation indicator to the top, 90 degrees.



To adjust the column width, move the cursor between columns B and C. You should get the double arrow pointer cursor.



An easier way to adjust column widths for the contents of the widest cell is to double click the cursor between the two columns. Excel will automatically adjust the column for the widest item.



44

With cell B2 still selected, click the **Format Painter.**  Click in cell C3 and drag to cell F3.  All book titles should now have the same vertical alignment as cell B3.  Adjust the column widths to be just wide enough for the book titles.

Completely formatted

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | **Student** | Tale of Two Cities | Light in the Forest | The Outsiders | Red Badge of Courage | Twilight |
| 2 | Mohammad | | | | | |
| 3 | Christine | | | | | |
| 4 | Khateja | | | | | |
| 5 | Bob | | | | | |

## Formatting Data – Merging Cells, Center, Underline, and Bold

Open the workbook *Center, Underline and Bold*. Copy the contents of this the worksheet to Sheet2 of your Gradebook workbook.

Highlight cells A4 through G4. Click on the **Center Button** on the Formatting Toolbar. While these cells are highlighted, click on the **Bold Button** on the same toolbar. Then click on the **Underline Button**.
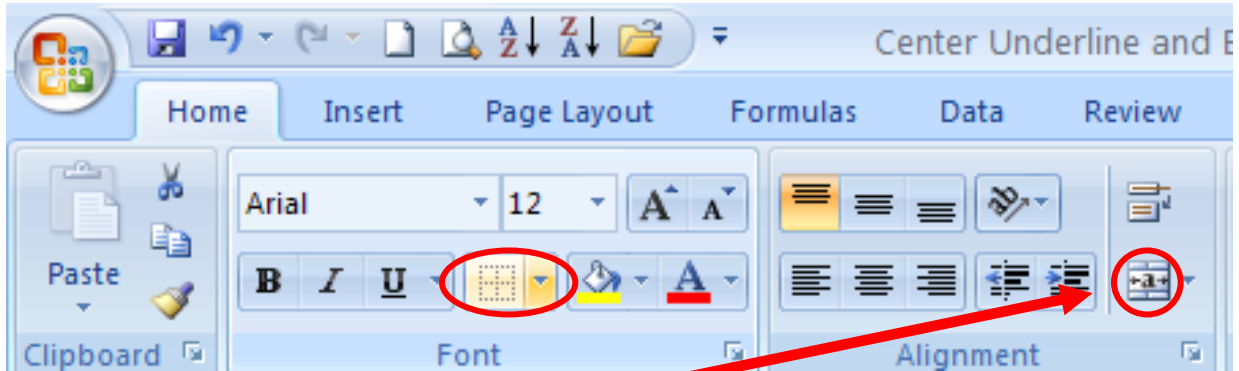


1. Merge cells A1 to G1. 

2. Bold the title. Draw a Thick Box Border around the title. 
3. Bold, underline, and center all column headings.
4. Draw boarders around all entries.
5. Right-align the Total. Italicize the Total. Color the Total red.
6. Center align the totals for each column.

Your table should look similar to the example below.

| ISG District Attendance for School Year 2007-2008 | | | | | | |
|---|---|---|---|---|---|---|
| **Number of Students** | **Yanbu** | **Dhahran** | **Jubail** | **Rahema** | **Asir** | |
| August | 16 | 22 | 23 | 24 | 13 | |
| September | 20 | 18 | 9 | 5 | 21 | |
| October | 19 | 6 | 12 | 9 | 9 | |
| November | 14 | 23 | 21 | 7 | 11 | |
| December | 18 | 8 | 12 | 14 | 18 | |
| January | 23 | 7 | 13 | 22 | 18 | |
| February | 14 | 10 | 17 | 25 | 16 | |
| March | 18 | 16 | 16 | 22 | 10 | |
| April | 14 | 11 | 6 | 5 | 13 | |
| May | 23 | 11 | 20 | 24 | 12 | |
| *Total* | **180** | **131** | **149** | **156** | **140** | |

## Renaming Worksheets

Open the document "Renaming Worksheets".

Notice that Sheet1 is named Sheet1, not Sheet 1 (space between Sheet and 1). If a space is left in the name, it cannot be used to hyperlink data. It is always a good idea to name a worksheet without spaces in the name.

Double click on the spreadsheet name, Sheet1. While the name is highlighted, change the name - by typing the new name over the old name. Or you can right-click on Sheet1 and select Rename.
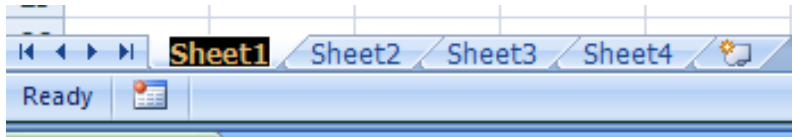


Rename Sheet1 to MinusGarth
Rename Sheet2 to WithGarth
Rename Sheet3 to WithPage18
Rename Sheet4 to Gradebook

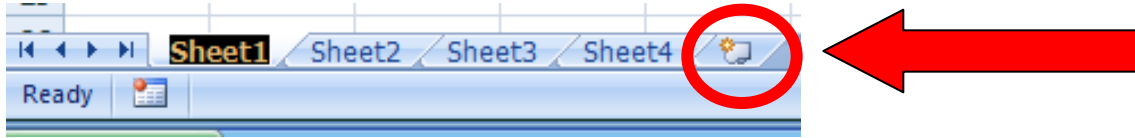Using the same process, you can change the worksheet tab colors.
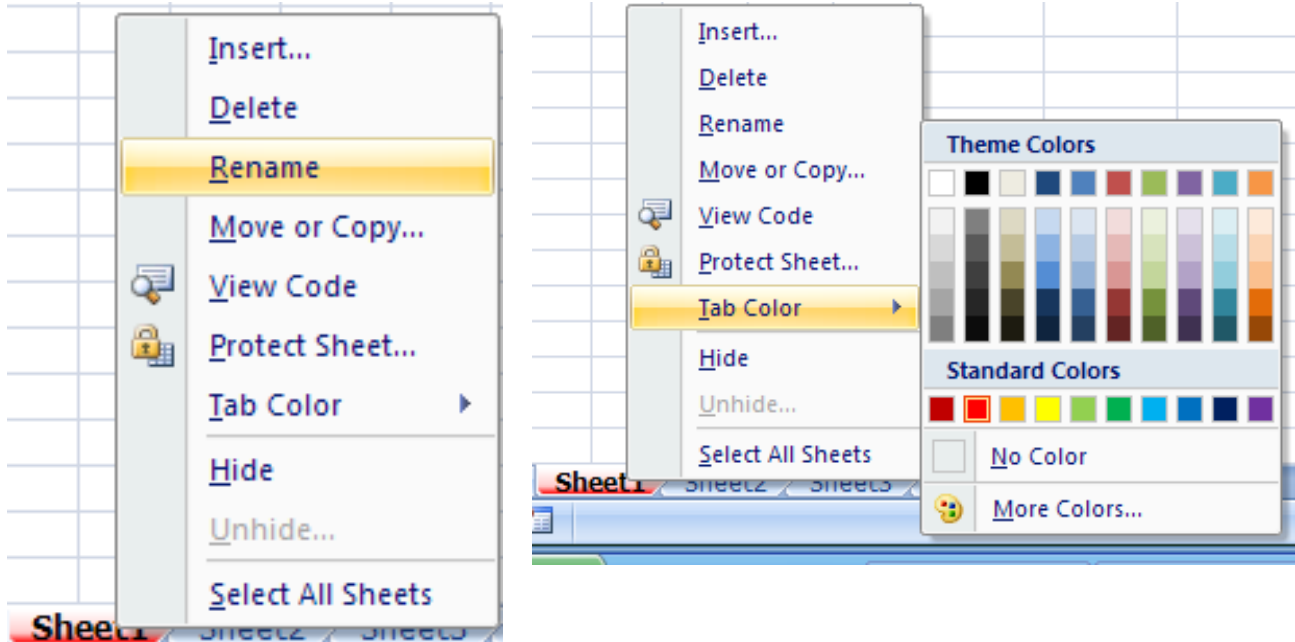


Change the color of MinusGarth to Red; WithGarth to Blue; WithPage18 to Green; and Gradebook to Yellow.
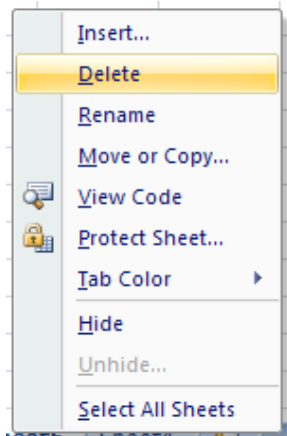
## Adding Worksheets



Click the new worksheet icon to add a worksheet to your workbook. Rename the new worksheet and change the color. Move the new worksheet to the front of the list (click and drag).



Right-click on the new worksheet. Select Delete to delete it.

Prior to turning in your gradebook, add a fourth worksheet. Name your worksheets, Quarter1, Quarter2, Quarter3, and Quarter4. Make each worksheet a different color
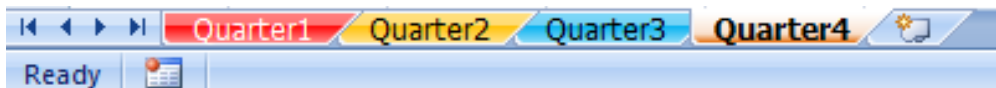


Copy the names from Quarter1 and paste them in the other three quarters.

What your gradebook should contain:

1. Five students, six assignments, an average grade rounded to one decimal place, a letter grade calculated from a lookup table, conditional formatting for students under 80% and students over 88.9% .
2. Four worksheets named Quarter1, Quarter2, Quarter3, Quarter4. Each given a different color.
3. A fifth worksheet named VerticalAlignment, color it too.
4. Upload your Gradebook to the Gradebook Assignment folder.

Table of Contents