DATA VALIDATION and CONDITIONAL FORMATTING

- Data validation to allow / disallow certain types of data to be entered within a spreadsheet
- Using Data Validation to choose a value for a cell from a dropdown list predefined with a list of data with a defined name
- Formatting certain cells to only accept a date value with parameters
- Returning Error Messages if Data Validation is not passed for a particular cell value
- Conditional Formatting may be used to highlight values in a particular column based on their values
- Quickly identify items that need attention within a spreadsheet using the Conditional formatting tools within Excel

This session will cover a number of functions in Excel that allow for better data entry and will show you how to quickly identify items within a spreadsheet that fit a certain criteria.

Data Validation

When creating a form in excel, or using fields to set criteria or parameters for a query, it may be important to limit the type of data a user us allowed to key into the field.

The Data Validation function in Excel limits the user's ability to fill in a field by setting criteria on the cell.

On the toolbar, the Data Validation option is found under the DATA tab – Data Validation.
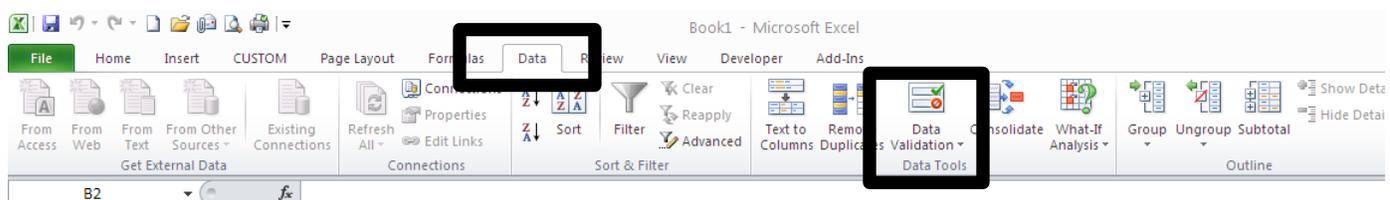

Once Selected, you are presented with the options to set in the cell / range for the validation. This functionality ensures that the data entered in a cell matches the pre-defined criteria of the cell value.

By default – Data Validation is set to "ANY VALUE" - this allows the user to enter anything into the cell.
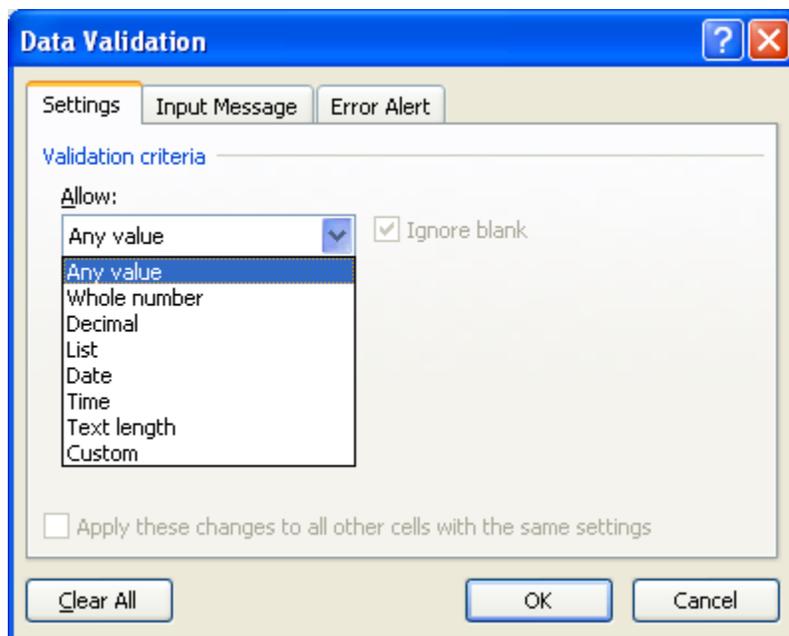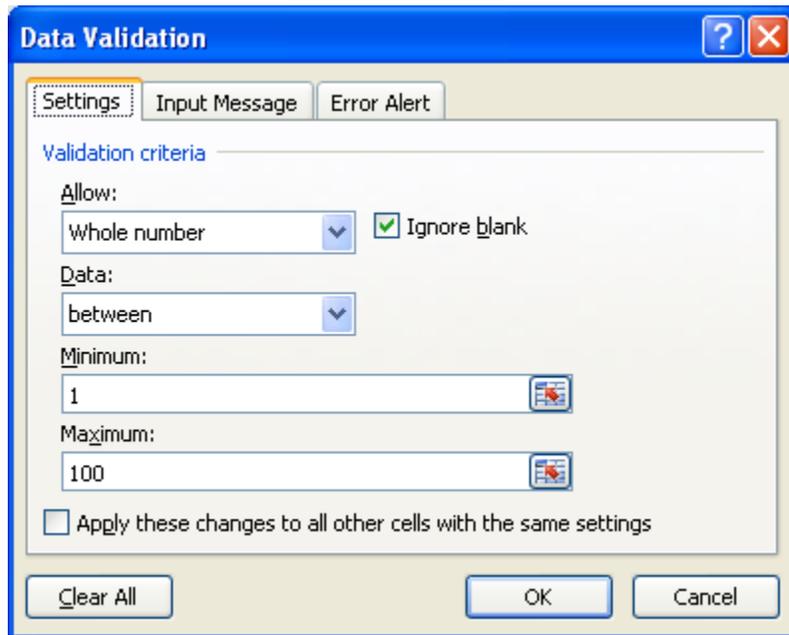
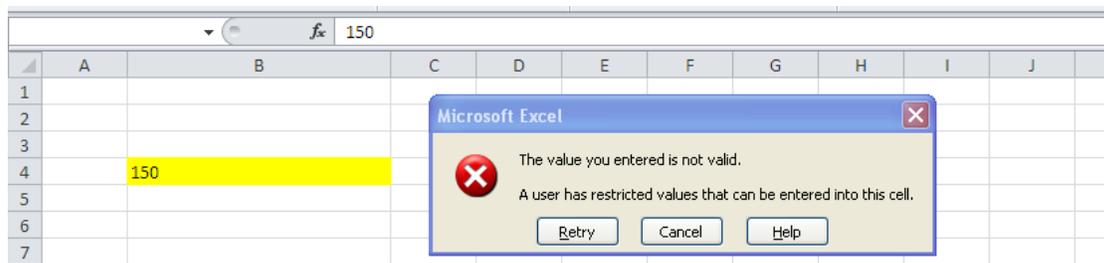## Data Validation - Whole Number:

When selecting the option to allow WHOLE NUMBERS in a cell, you will have the option to put parameters on the range of allowable numbers. This may be useful if you are tracking a percentage of completion entry on a spreadsheet.
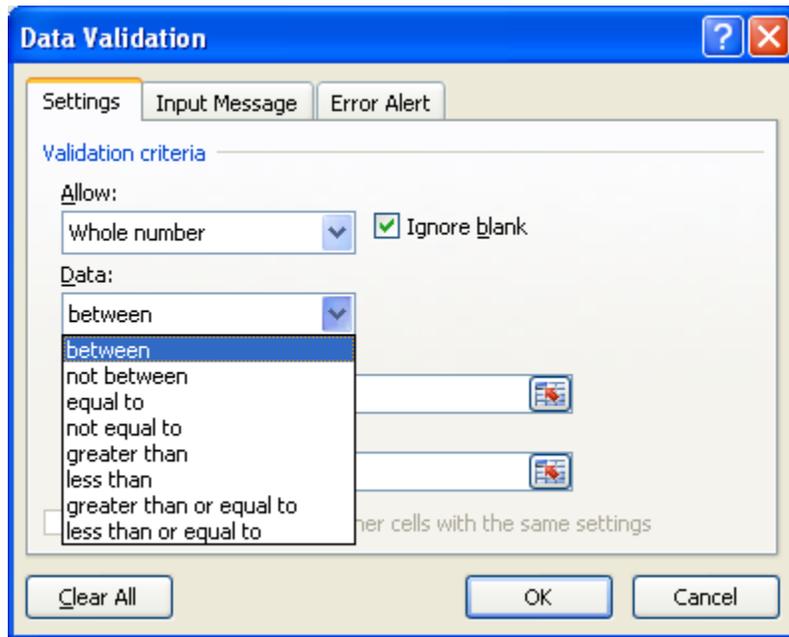
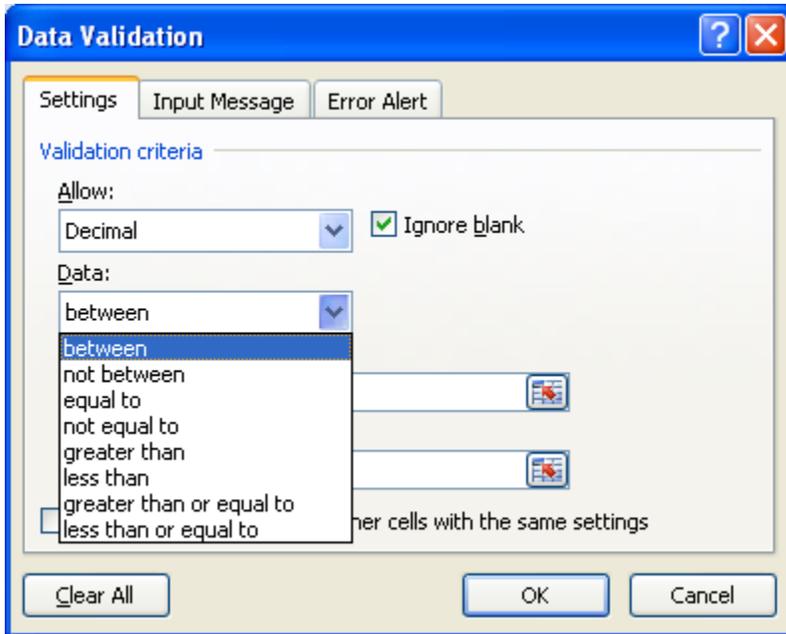In this example – the data validation will allow any whole number between 1 and 100.

When a cell value is entered that does not match the defined criteria, a warning message appears. (More on this later)
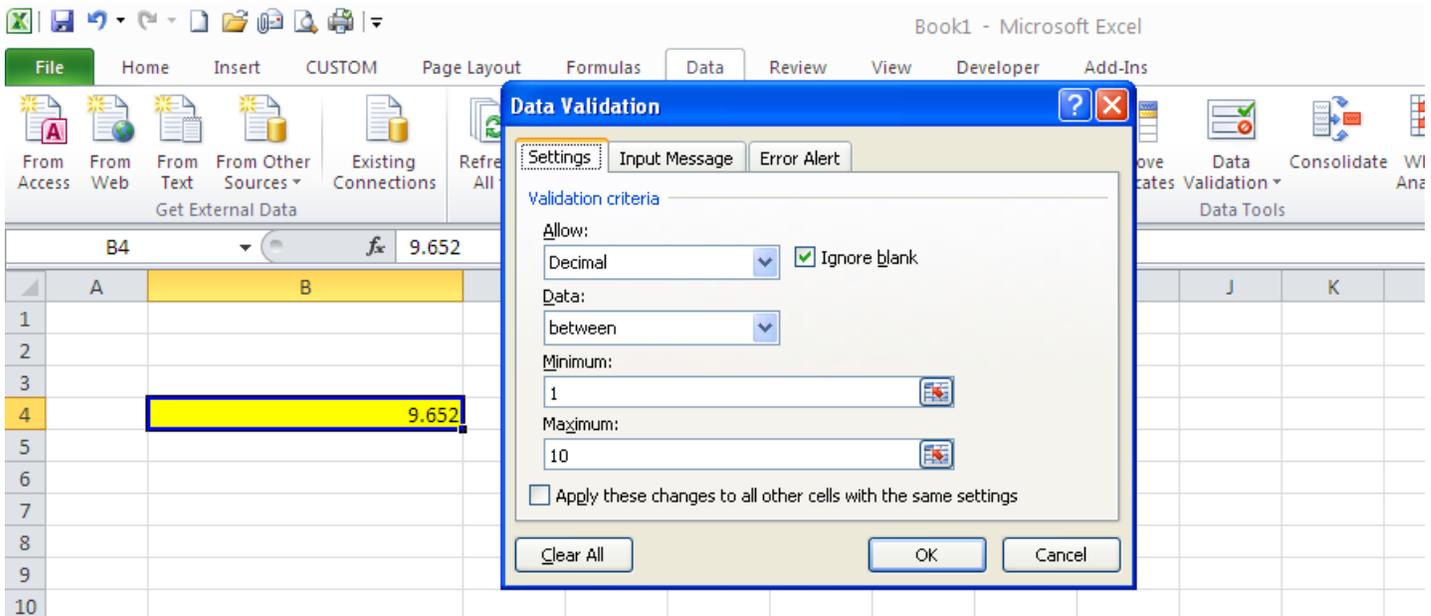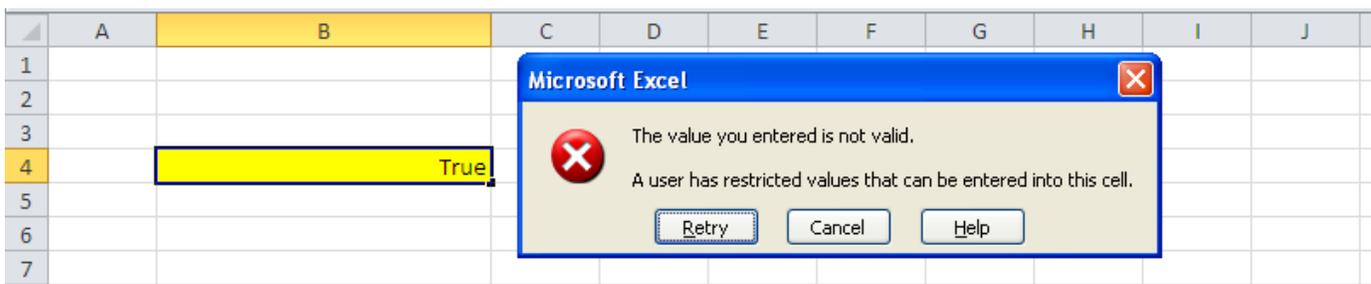
Data Validation - Decimal:

This function is similar to the Whole Number function, but allows the user to enter a number with decimal places.

I have changed the setting here to only allow values between 1 and 10. But the Criteria to allow Decimal will let me enter a number with unlimited decimal places.
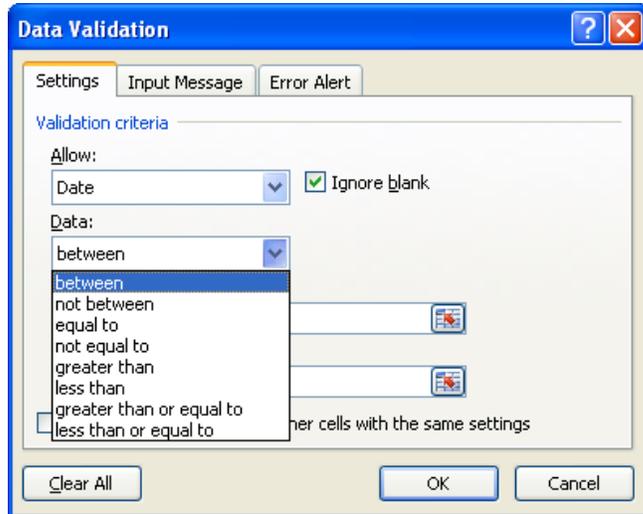

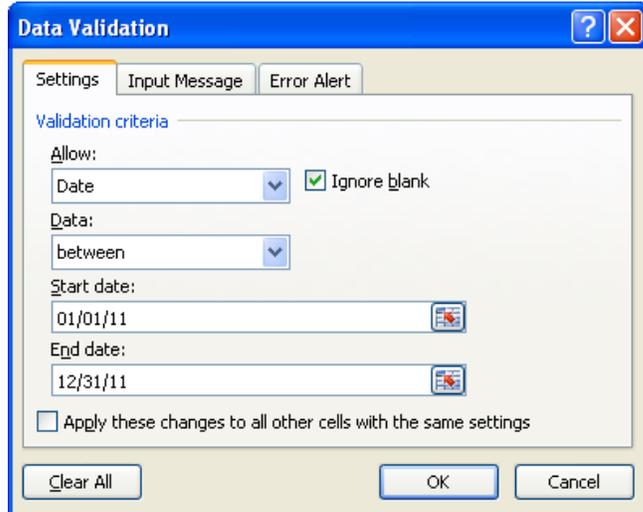When using numeric based validation, an error will appear if a text based data is entered.
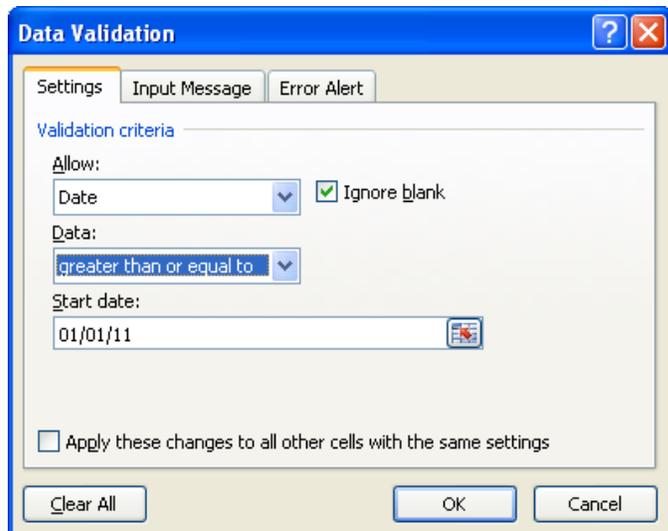
Data Validation - Date:

You may define a start date and an end date when entering in date fields in the validation criteria.

These settings will ensure that a valid date is entered between 01/01/11 and 12/31/11

The following setting ensures that the date entered is greater than 01/01/11

Data Validation - Time:

Time based fields for data validation ensure that a time entered in a field will fall into the selected criteria.

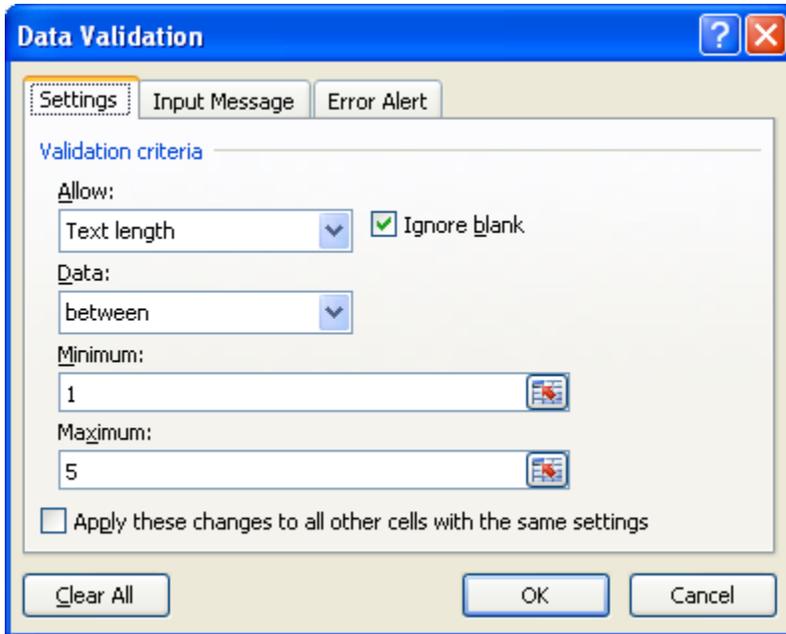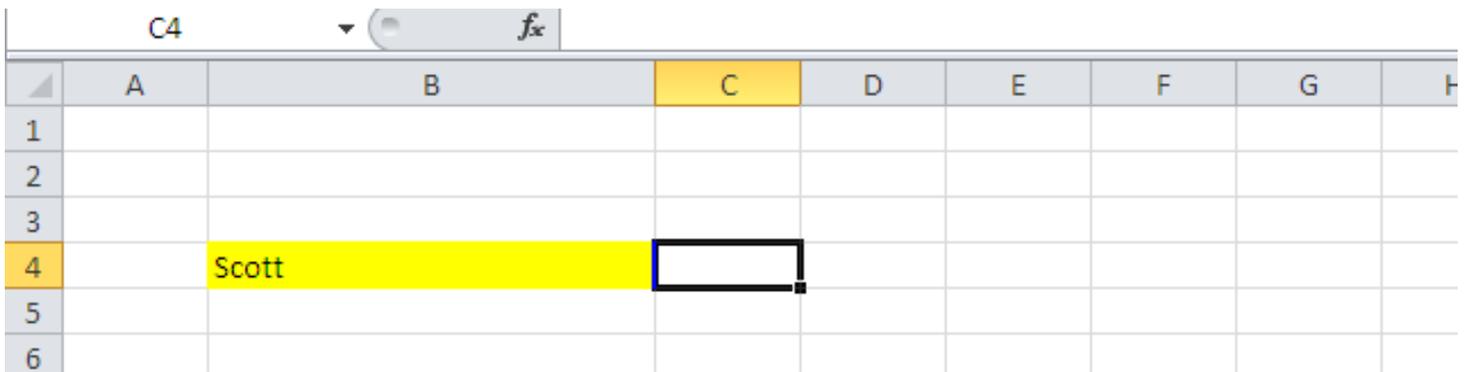An error will occur if the time entered is outside of the set criteria.

Data Validated :
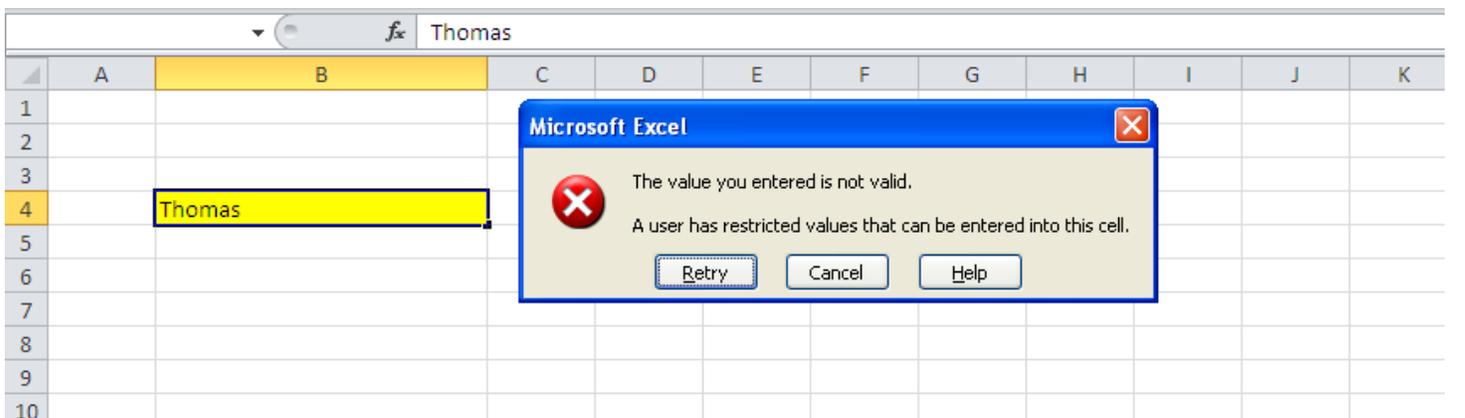
Data Validation – Text Length:

Text Length is the first text based validation field. It basically limits the number of characters that a user is allowed to enter in a field.
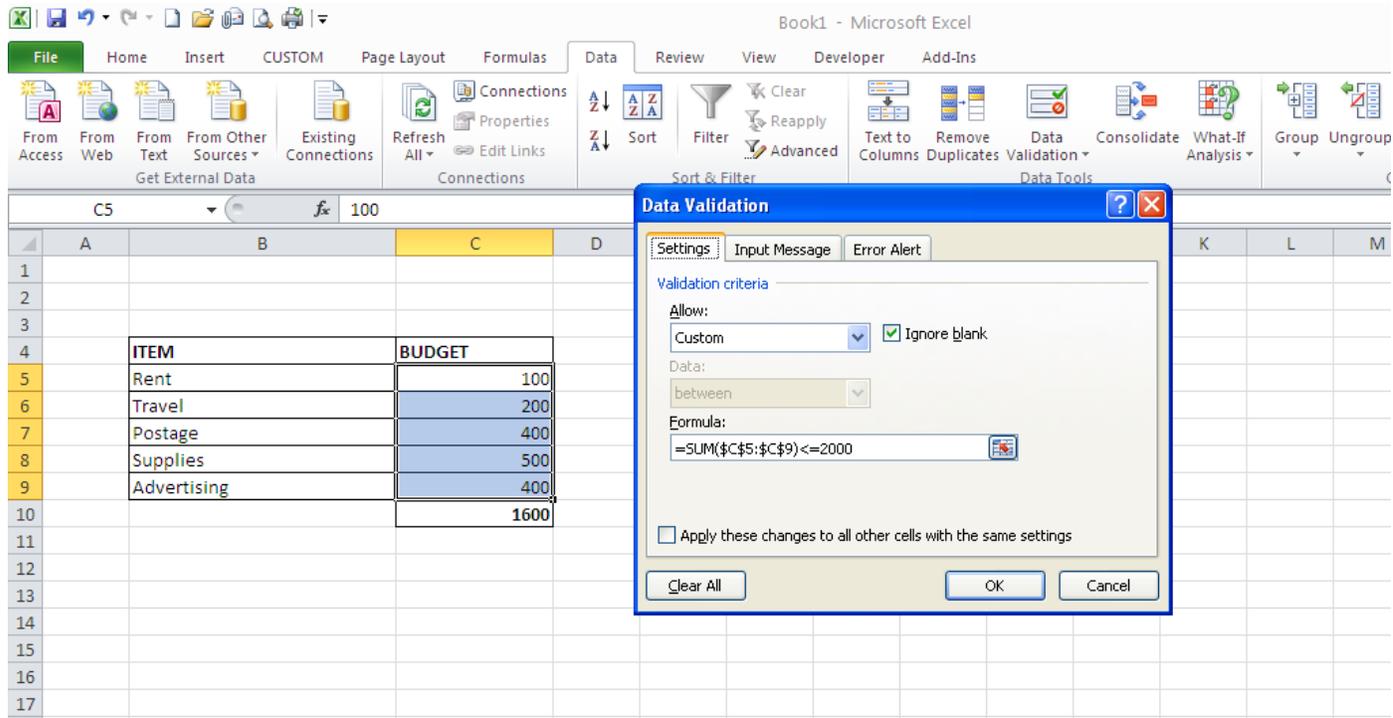

Data Validated:

Data Entry error:

Data Validation – Custom:

The CUSTOM function allows a great deal of flexibility on validating items based on a formula.

In this example, we want to limit the value of the sum to $2,000.00 for the data entered in cells C5 – C9.

- Select cells C5:C9 . This is the first time we have selected a **range** of cells to allow data validation.
- Choose Data - Data Validation
- Choose Allow: Custom
- For the formula, use SUM to total the values in the range $C$5:$C$9. The result must be less than or equal to $2,000.00:   **=SUM($C$5:$C$9) <= 2000**

If the Sum of the selected cells exceeds the amount defined in the Formula, you will receive a validation error.
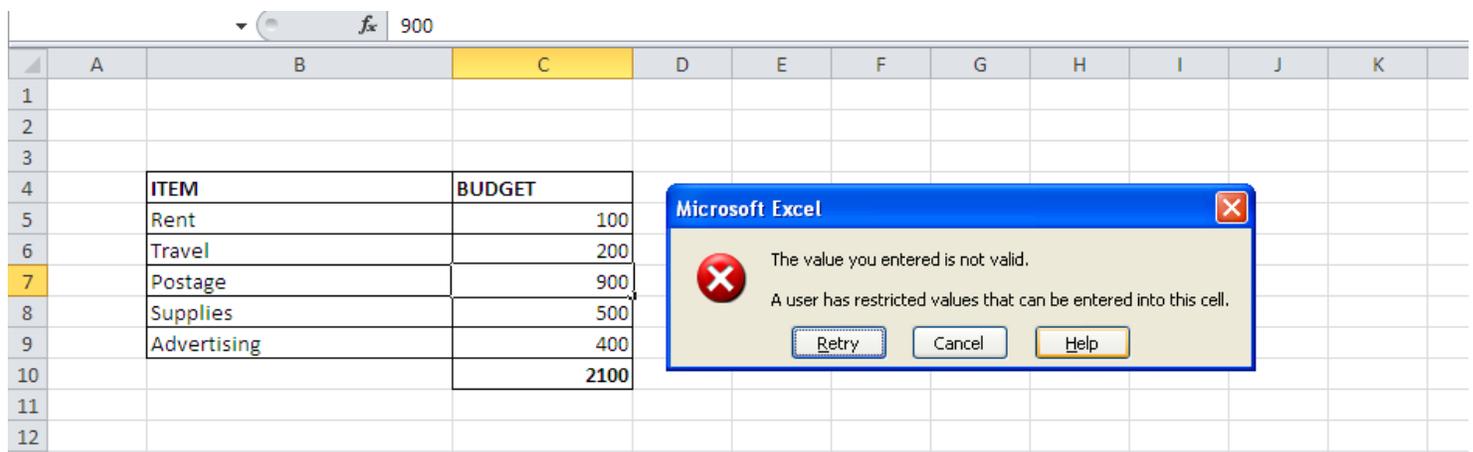
Data validation - Input Message:

This tab will allow you to prompt the user for what type of data you are expecting to be entered in the field.

In this example, we are prompting the user to enter a date between 01/01/11 and 12/31/11. Selecting the "Show input message when cell is selected" will open a box that lets the user know of the required data type.
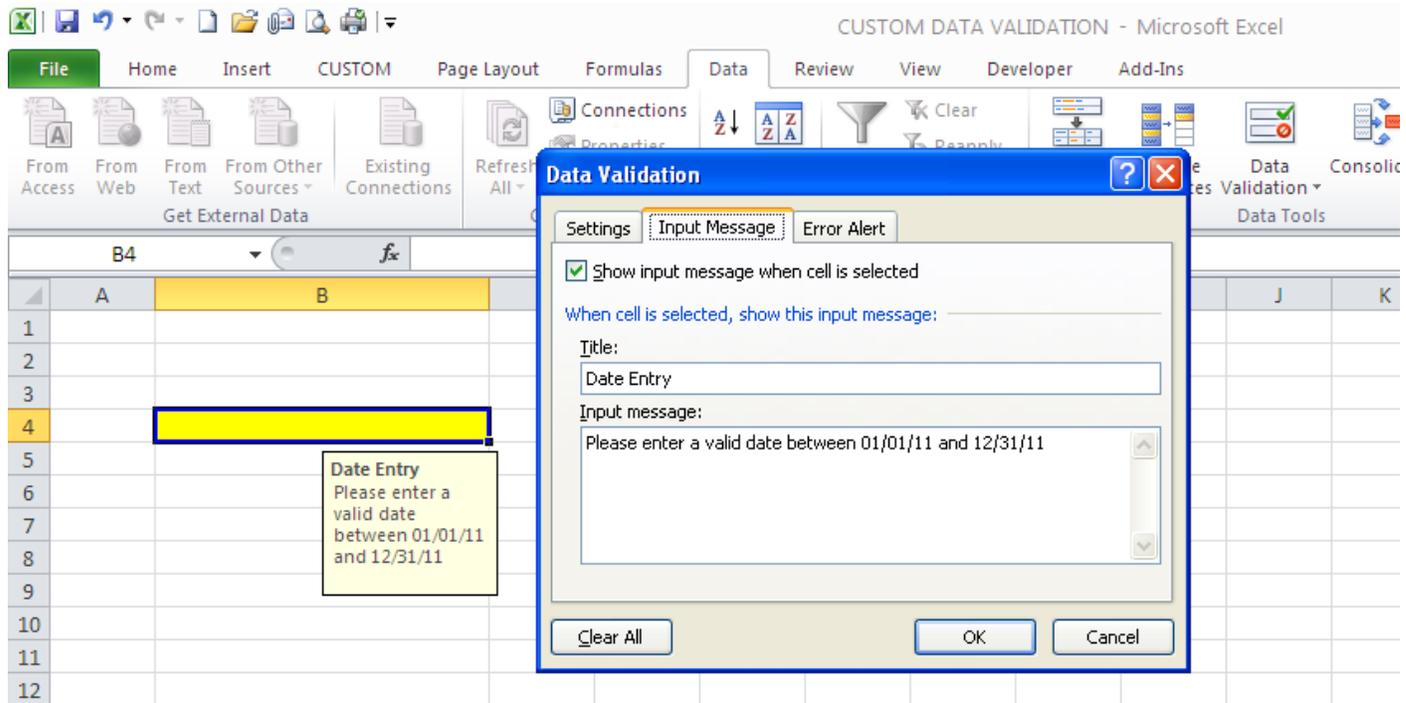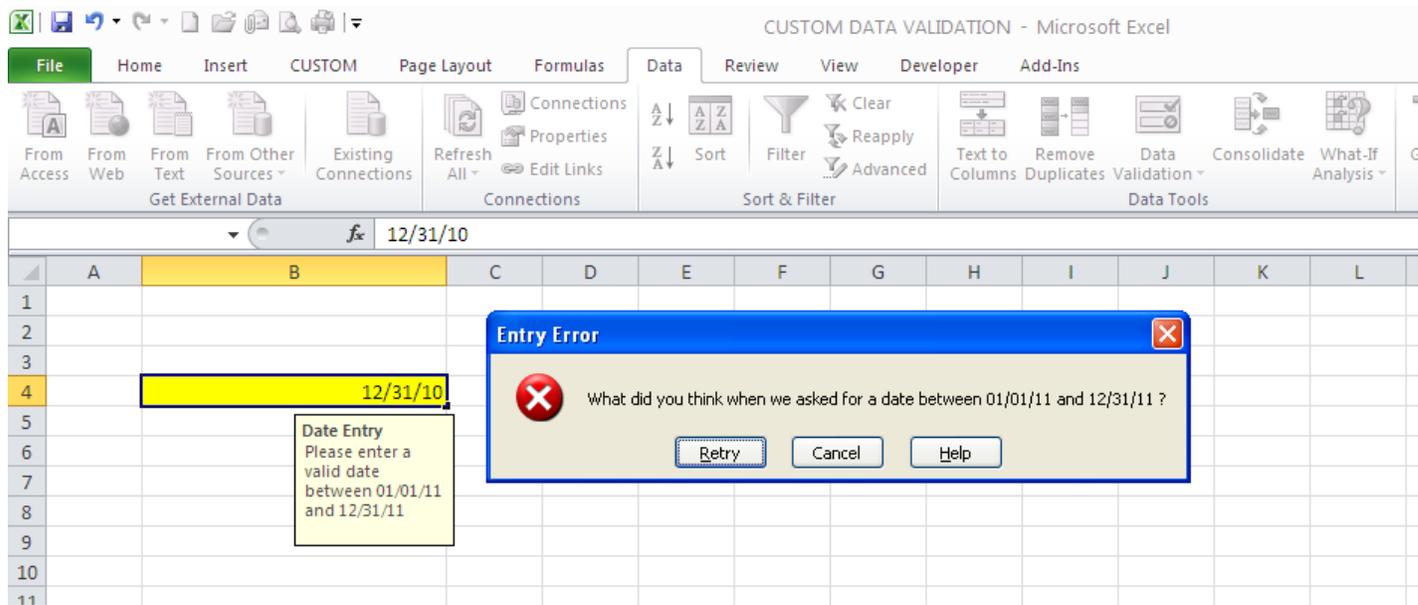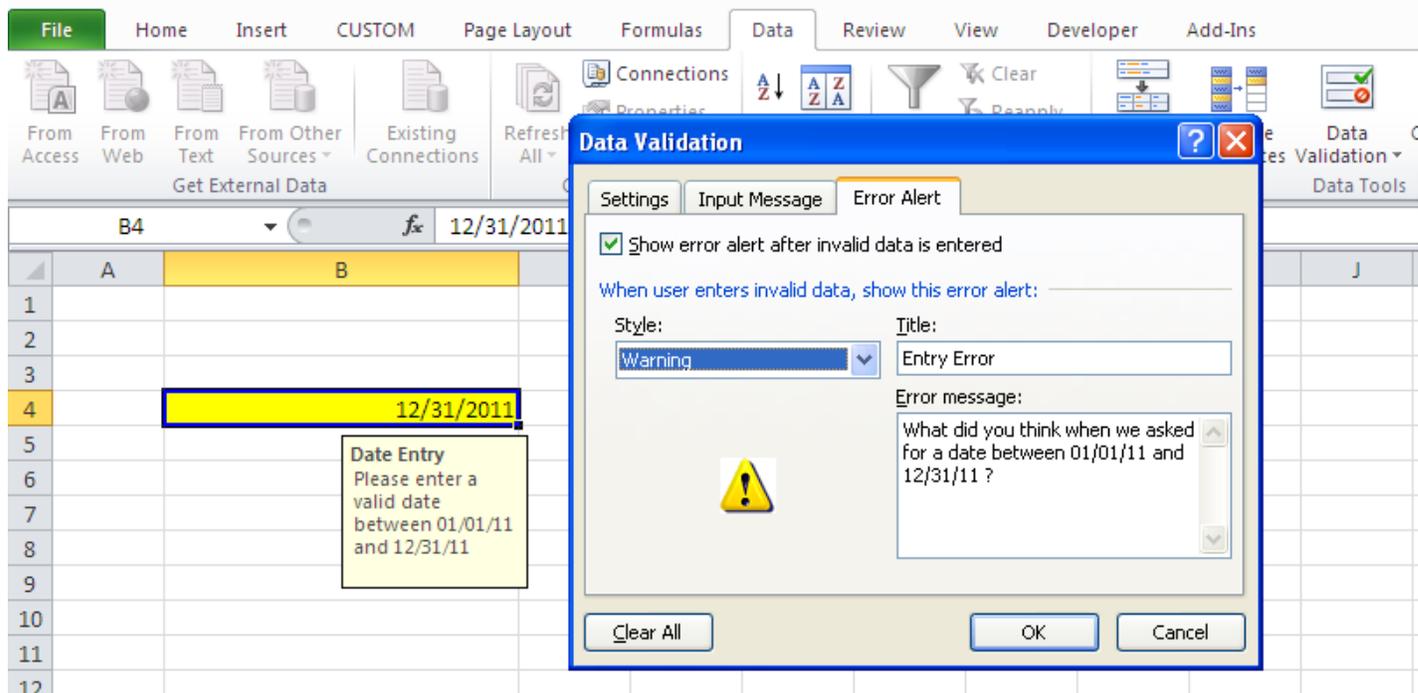

Data validation – Error Alert:

You may override the standard alert that does not inform the user on what is expected be selecting the Error Alert tab. In this example – we will STOP the process to prompt the user for what is an allowable value within the selected cell.
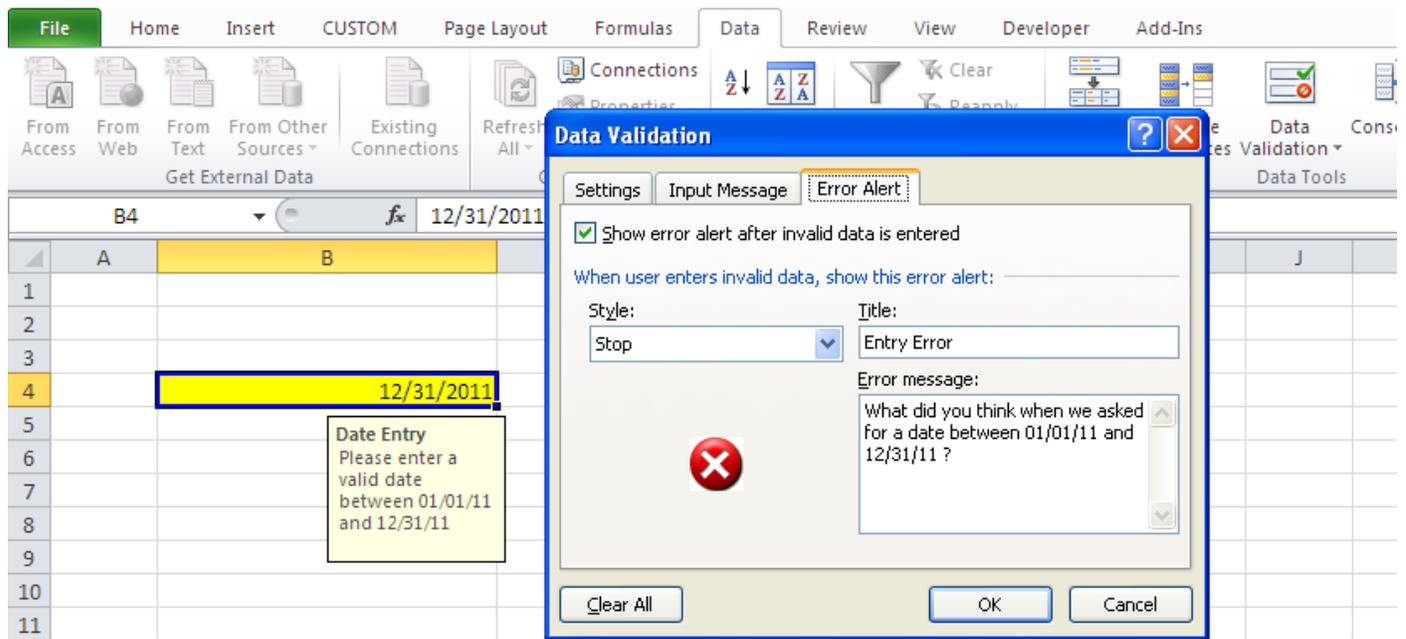
If data is entered that does not pass the validation, your custom message will appear.


You may also set the Error Alert to **WARN** the user that they are entering in an invalid value.

The WARNING Error Alert will allow the user to continue even though the data does not pass the validation criteria. Make sure this is the option you wish to choose as it subverts the validation you defined on the SETTINGS tab.
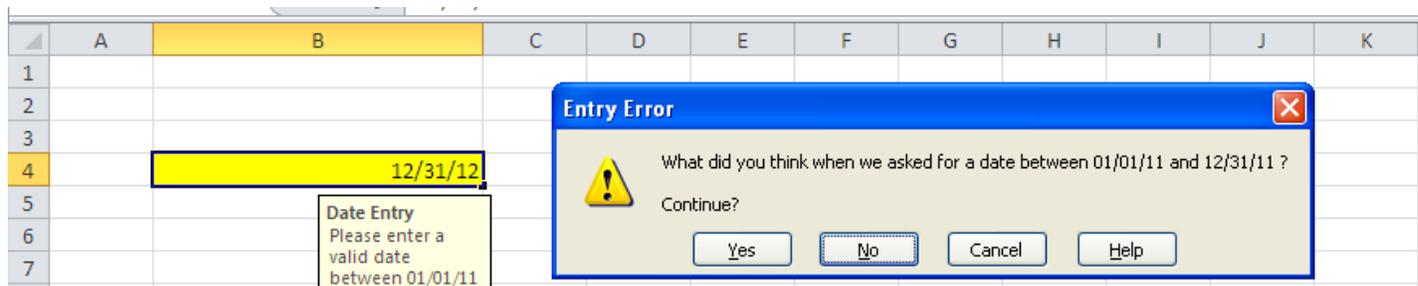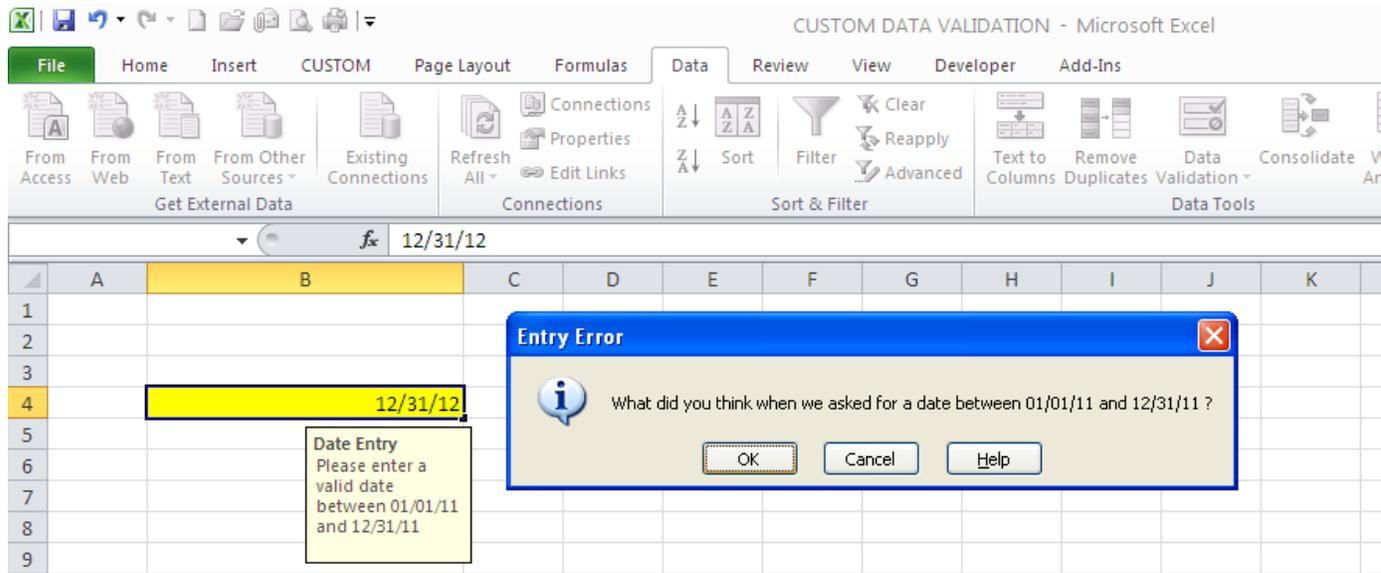
A third option is available when defining Error Alerts. This message may be defined as INFORMATION only.
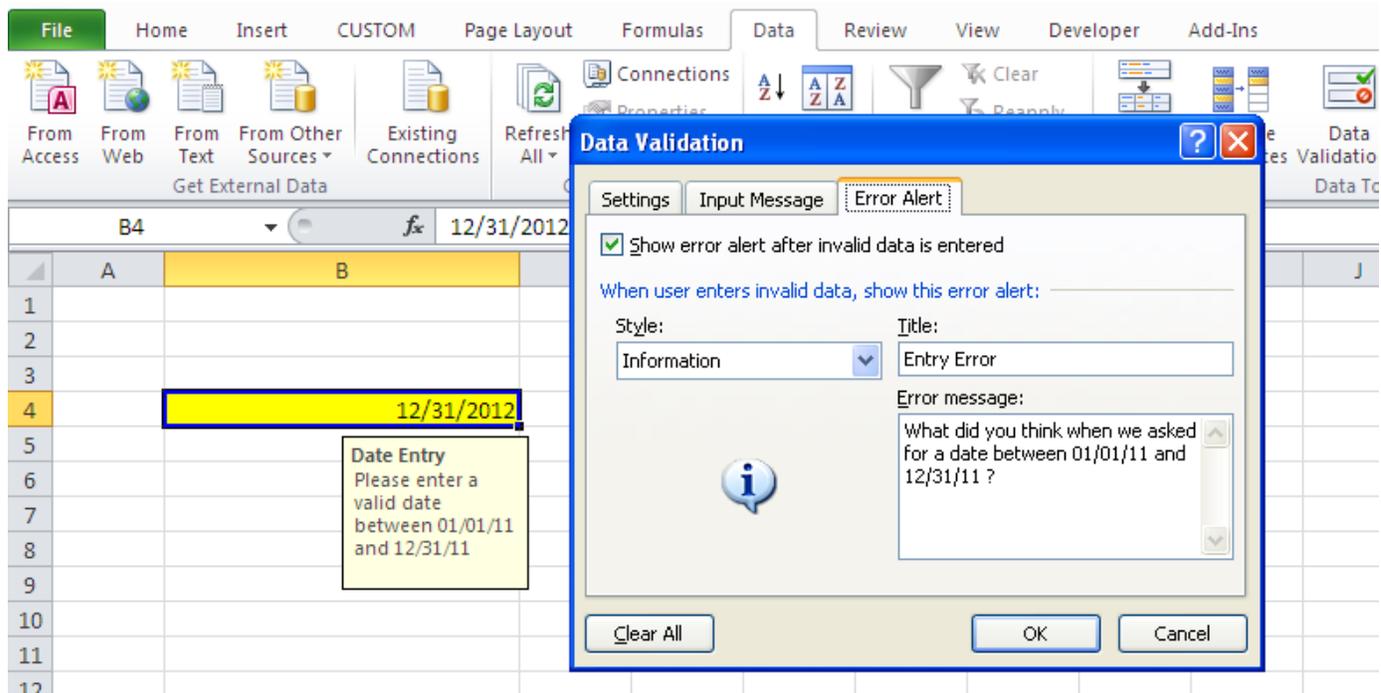
In this example, when erroneous data is entered, the user will be prompted as follows:

This option will allow the user to click OK and accept the entry even though it does not pass the criteria.

NOTE: These settings will be based on the needs of the individual form. Special consideration should be placed on selecting any option other than STOP, as the INFORMATION and WARNING option will allow the user to enter a value that does not pass the validation.

Data Validation – List:

The List option in Data Validation allows an easy method of entering values from a predefined list of items.

The first thing to know about selecting the LIST option is that you must first define a NAED RANGE for the list of items being used.

I have created two individual lists. One is a query of my active jobs and the other is Months of the year.

In order to use validation against a list, we must NAME the range. This will create a reference that defined all of the values in a particular cell range.

Start by highlighting the appropriate data range. In this example, I wish to select all of the values in column A, as this list will expand and/or contract as new jobs are added to the list.

Access the **FORMULAS** tab and select **DEFINE NAME**.

If you have a column heading on the data set, the Named Range will assume that this is the value that is defined for the named range. In this example JOB is the NAME of the data set and it refers to any and all values in column A.

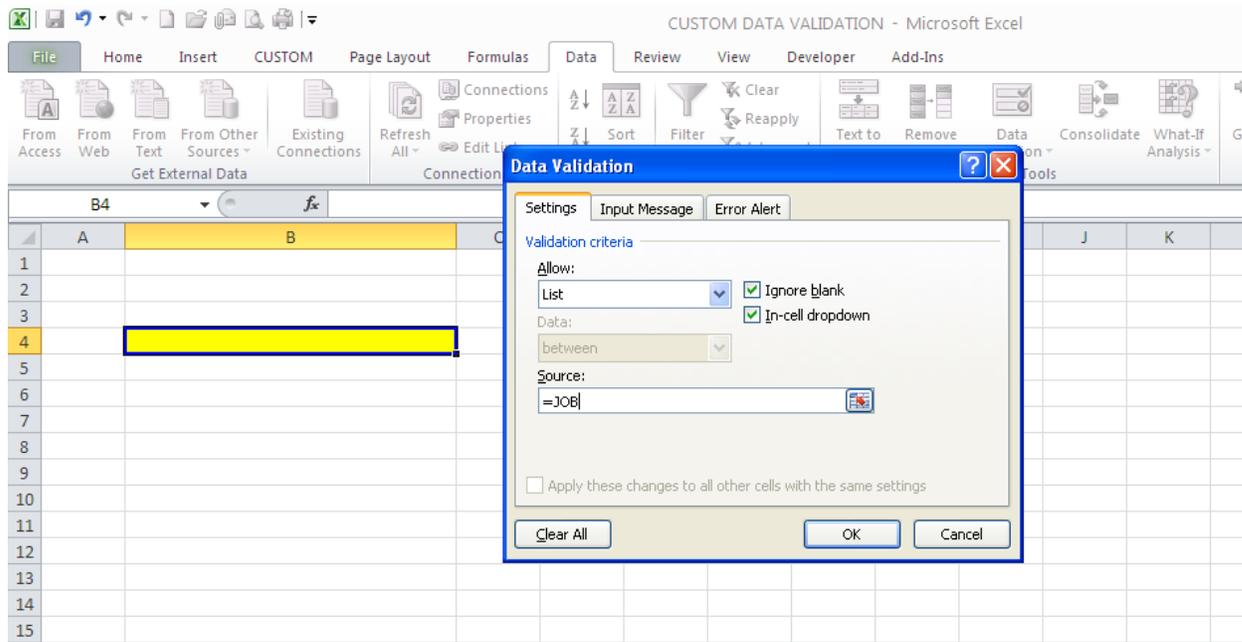Click OK to save the range.
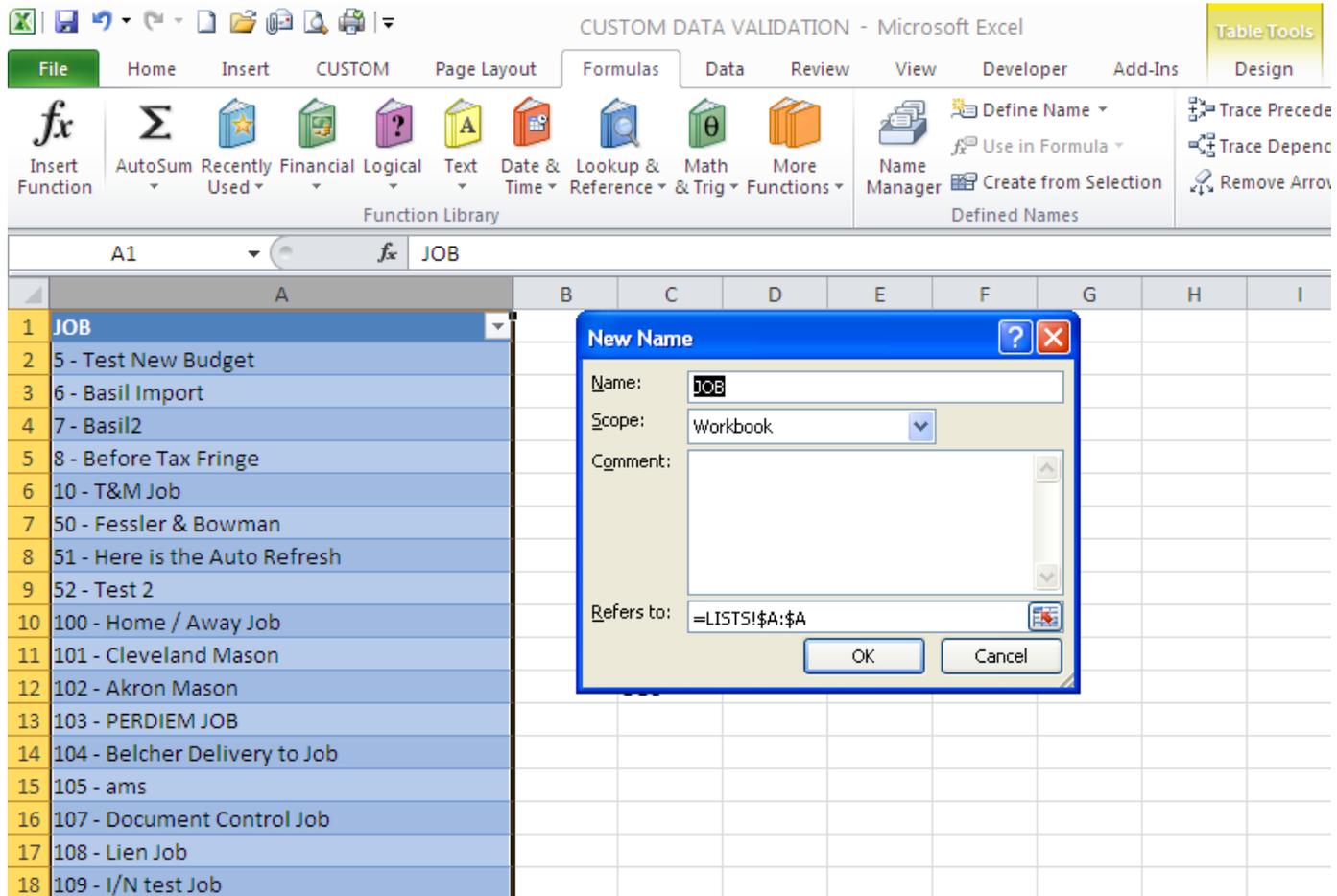
When selecting Column A, you will notice that the title in the upper left hand corner is now JOB.
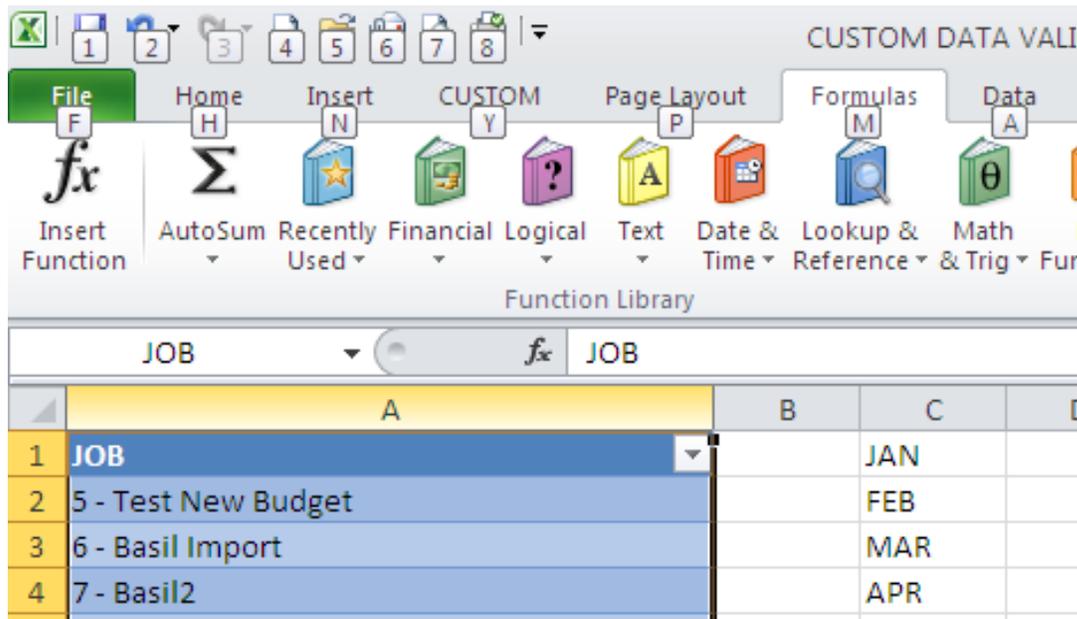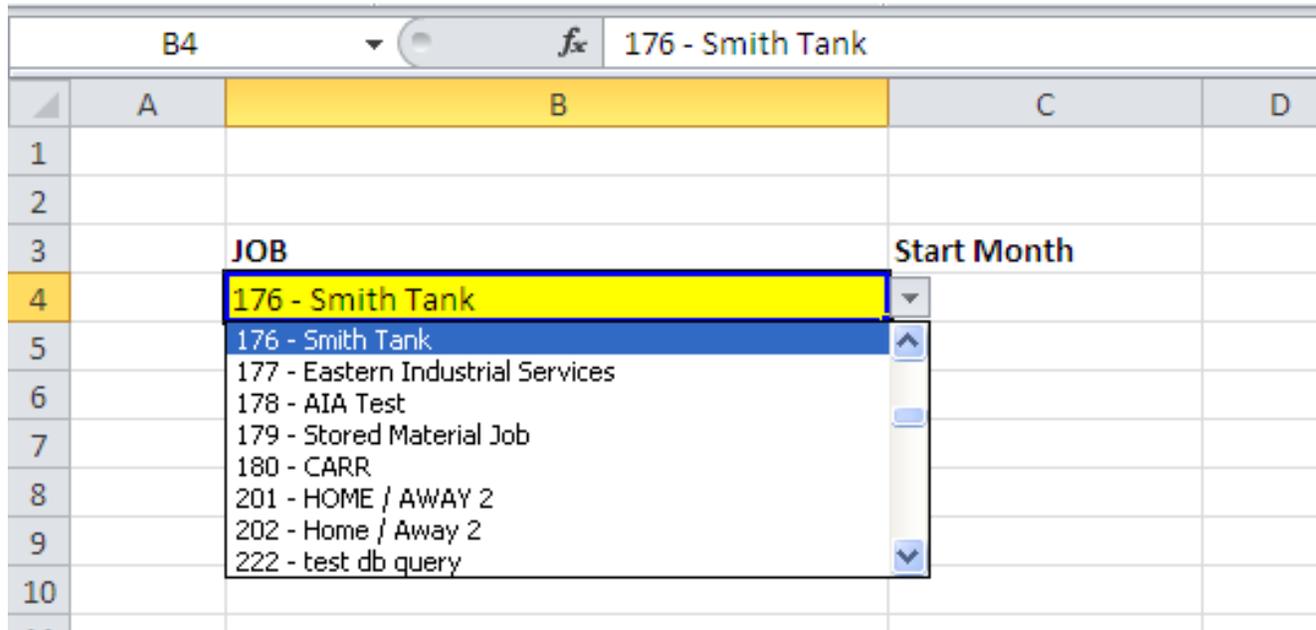
We can now set validation for the range of values that we have selected.

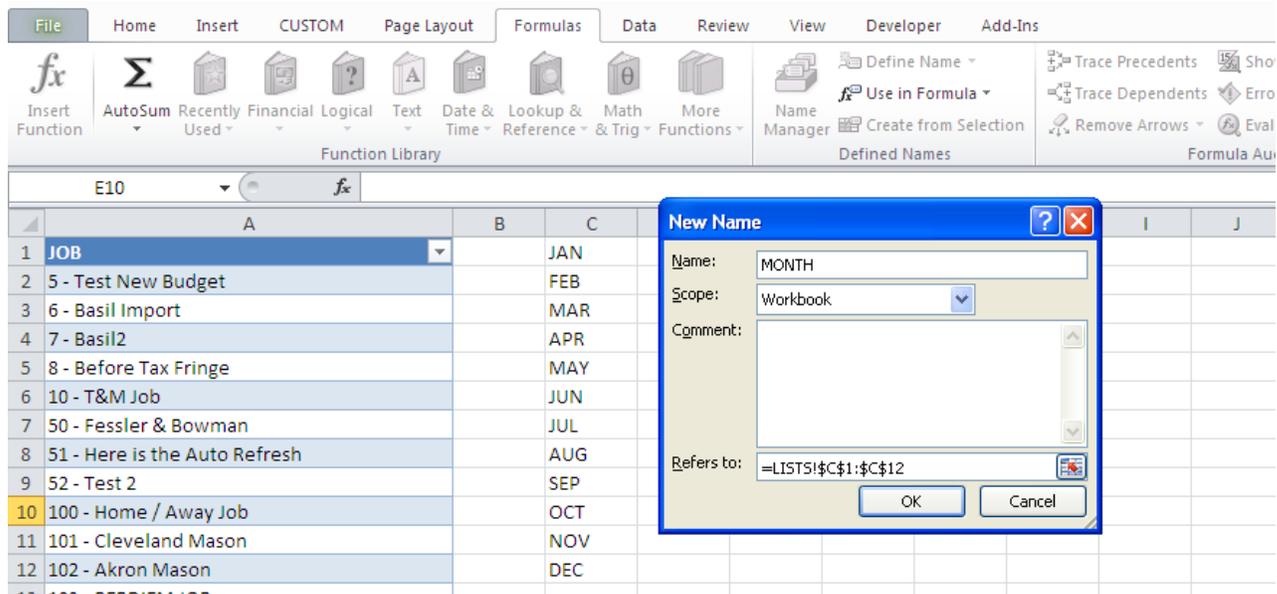The SOURCE will be the NAMED RANGE value preceded by the "=" sign.

When the "In-Cell Dropdown" is selected, we have enabled a dropdown menu to select a value from the data set defined in the named Range.

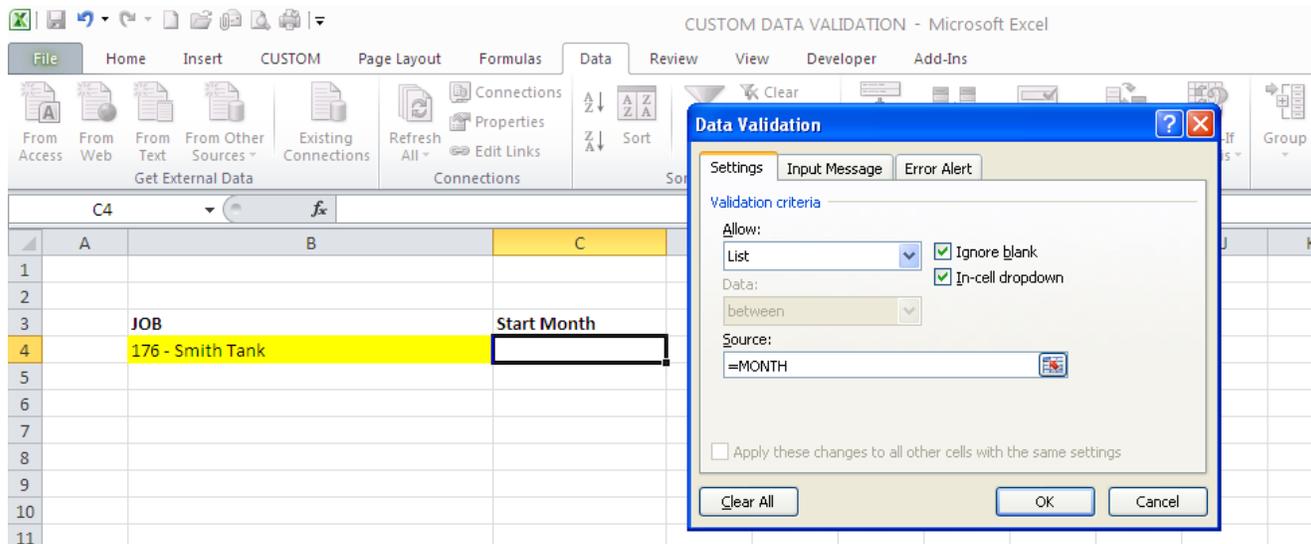## Selecting a finite range of cells for a named range:

In the previous example, we selected an entire column for the LIST / NAMED RANGE. In this example, we will define a named range for a specific set of cells.

Select the Range of cells that contain the data set. Since the data set does not contain a column heading, we will also have to set a name for the range. In this example, it will be titled "MONTH".
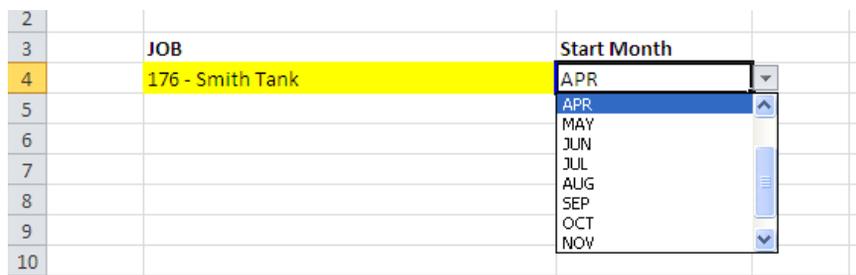

Set the Data Validation on your cell to allow the **SOURCE : =MONTH**

You now have a dropdown selection defined in the cell to choose a month.

CONDITIONAL FORMATTING

Conditional Formatting is another function that will allow the user to set "alerts" based on values contained within cells.

Basically, you will set criteria for the data set and then define the format of the cells.

In this example, we will be looking at a data set that includes The Job numbers and their Original Contract Amount.

	A	B	C	D	E	F	G	H	I	J	K
1	job_id	description	original_contract								
2	5	Test New Budget	$ -								
3	6	Basil Import	$ 72,000.00								
4	7	Basil2	$ -								
5	8	Before Tax Fringe	$ -								
6	10	T&M Job	$ 1,800,000.00								
7	50	Fessler & Bowman	$ 22,000.00								
8	51	Here is the Auto Refresh	$ 476,000.00								
9	52	Test 2	$ 52,000.00								
10	100	Home / Away Job	$ 722,000.00								
11	101	Cleveland Mason	$ 456,333.00								
12	102	Akron Mason	$ 476,000.00								

We will define the following criteria for the Conditional formatting:

- Contract Amount = 0 : Color the Cell Red
- Contract Amount > $ 1,000,000 : Color the Cell Green with Yellow text
- Contract amount < $ 1,000,000 : Color the Cell Yellow with Black text

	A	B	C	D	E	F
1	job_id	description	original_contract			
2	5	Test New Budget	$ -			
3	6	Basil Import	$ 72,000.00			
4	7	Basil2	$ -			
5	8	Before Tax Fringe	$ -			
6	10	T&M Job	$ 1,800,000.00			
7	50	Fessler & Bowman	$ 22,000.00			
8	51	Here is the Auto Refresh	$ 476,000.00			
9	52	Test 2	$ 52,000.00			
10	100	Home / Away Job	$ 722,000.00			
11	101	Cleveland Mason	$ 456,333.00			
12	102	Akron Mason	$ 476,000.00			
13	103	PERDIEM JOB	$ 45,000.00			
14	104	Belcher Delivery to Job	$ 5,500.00			
15	105	ams	$ 12,450.00			
16	107	Document Control Job	$ 15,647.00			
17	108	Lien Job	$ 870,000.00			
18	109	I/N test Job	$ 100,000.00			
19	110	PM Job	$ 1,100,000.00			
20	111	OCIP JOB - 100% OCIP	$ 92,664.00			

It is important to think about the order that the criteria will be defined for the conditional formatting, as a value of 0.00 is also less than 1,000,000. If you have problems with multiple formatting criteria, you may sequence the order in which the criteria is looked at.

To enable conditional formatting, select the range of cells that should be referenced. Access the HOME tab and select Conditional Formatting – NEW RULE.
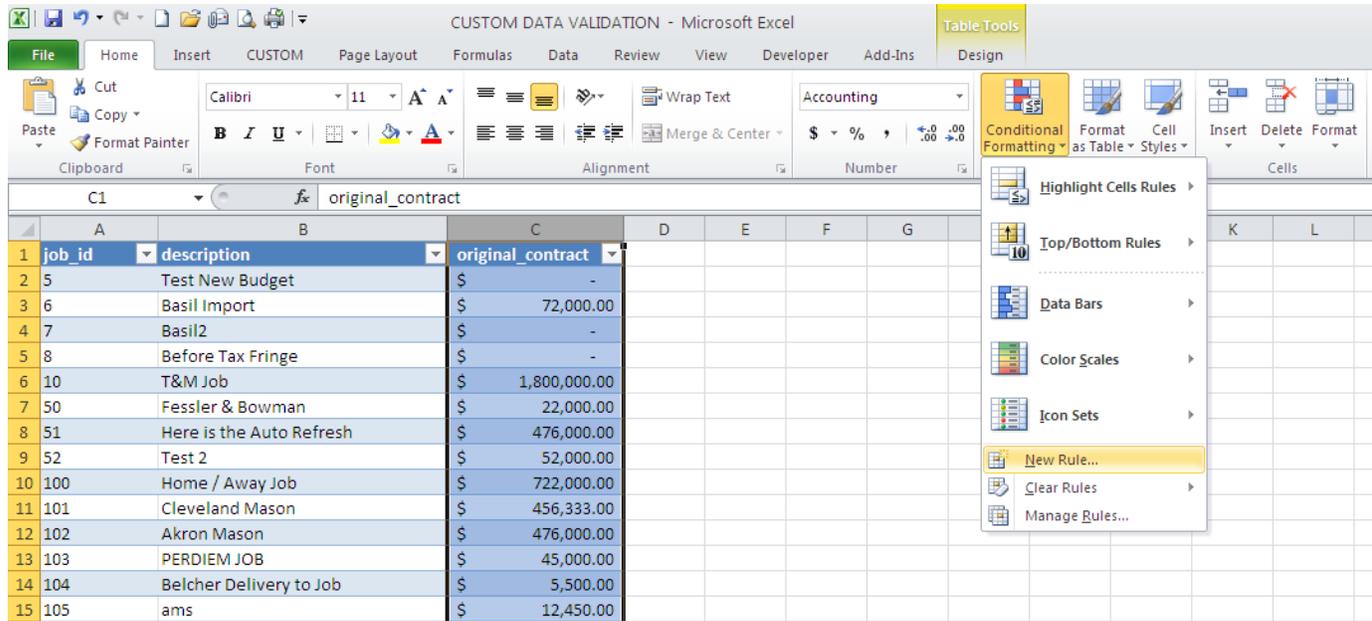
There are many options in the conditional formatting. We will focus on the "Format Cells That Contain" option.
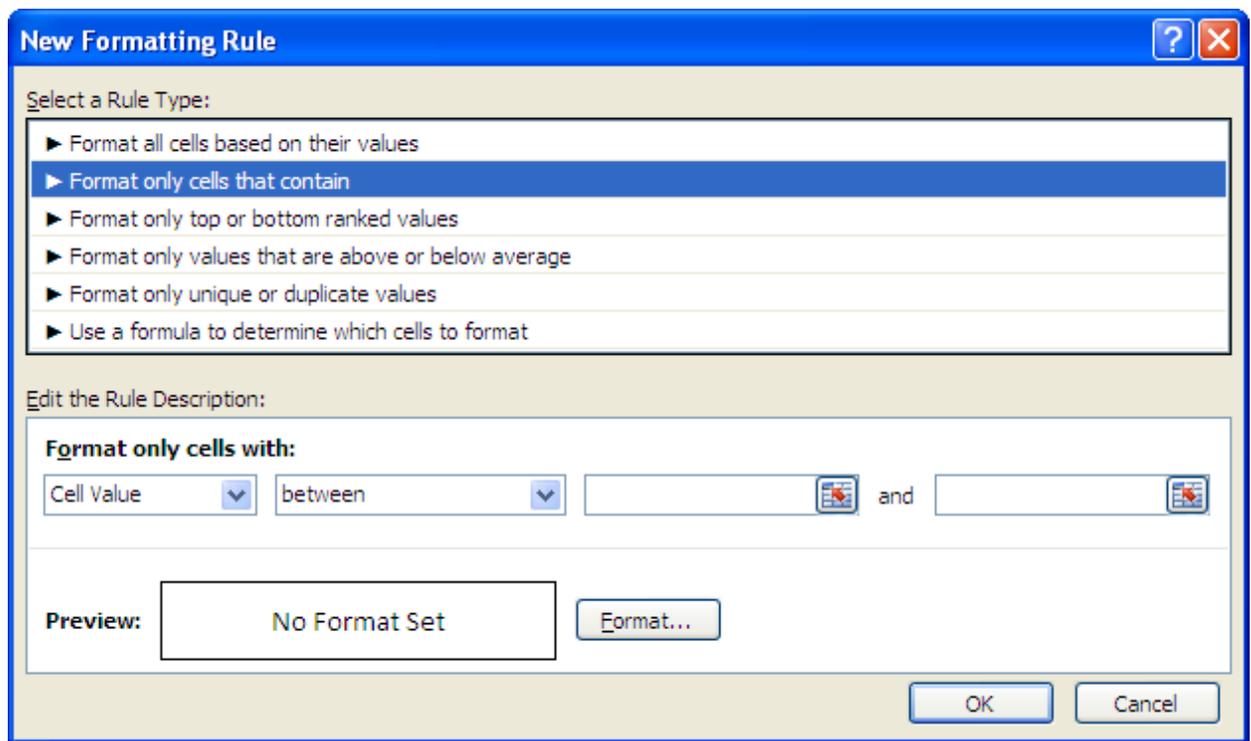
To create the first rule, we will select "format only cells with:"

Cell Value equals 0

Once the criteria is defined, select the FORMAT button to choose the behavior of the cell. This criteria will be defined as a cell filled in with red.

Click OK to save the criteria.

Highlight the entire column again and Select Conditional Formatting – NEW RULE again.
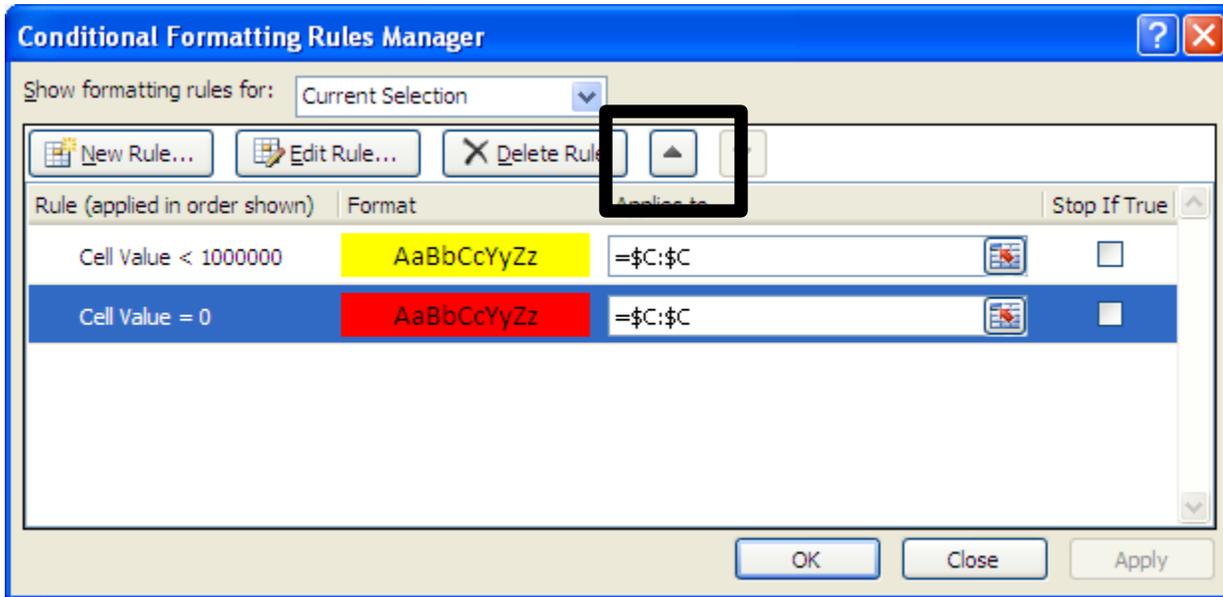
Format these cells to fill with yellow.
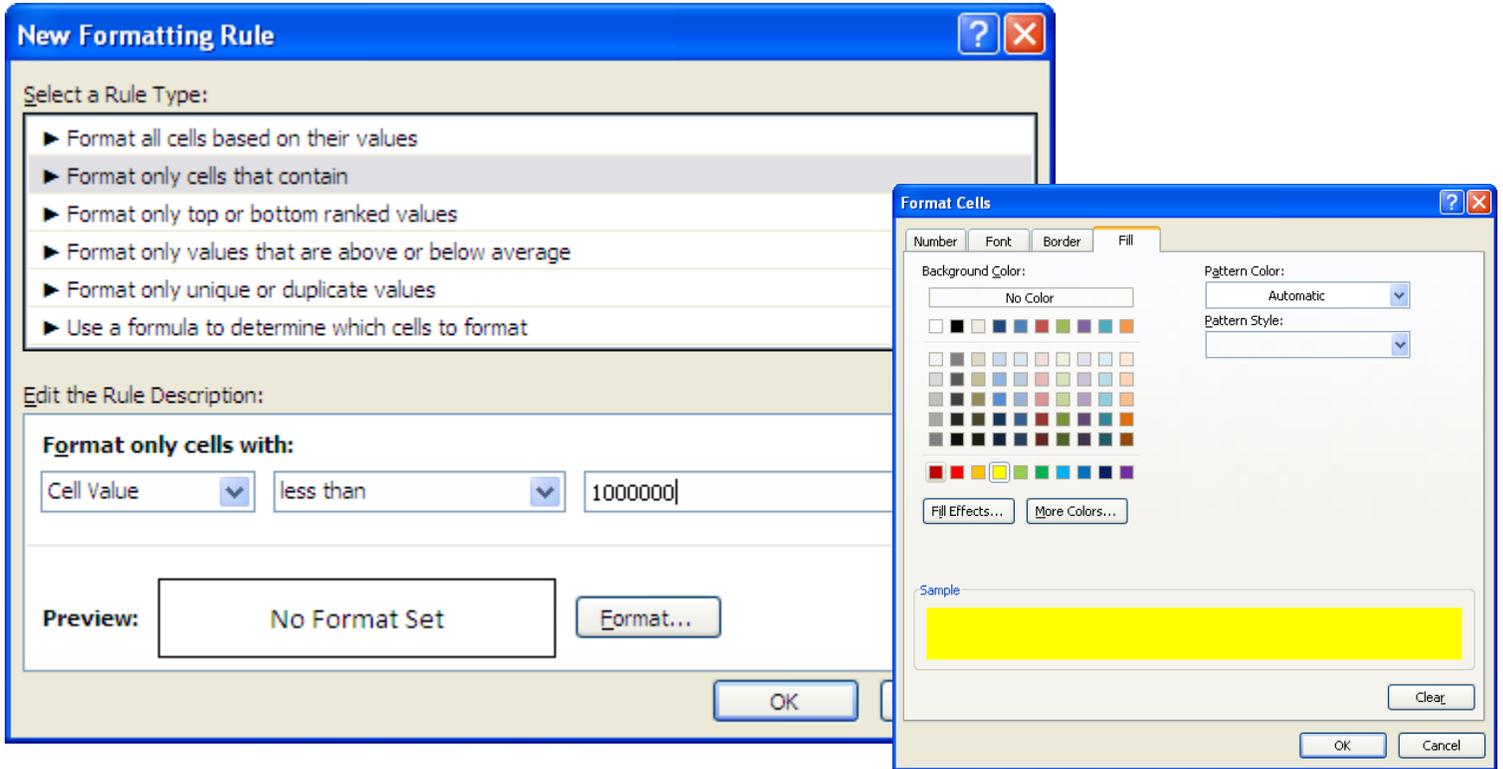
OOPS : You will see that we trumped our last rule, now any value less than 1,000,000 will show as a cell filled with yellow.
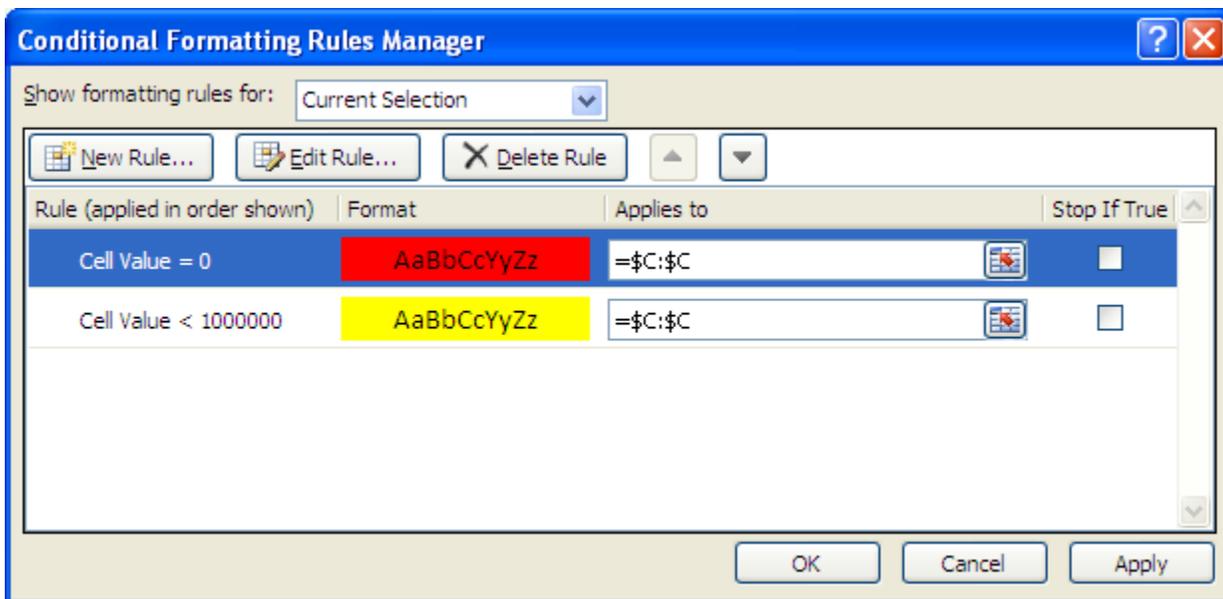

We can solve this situation by selecting Conditional Formatting – Manage Rules
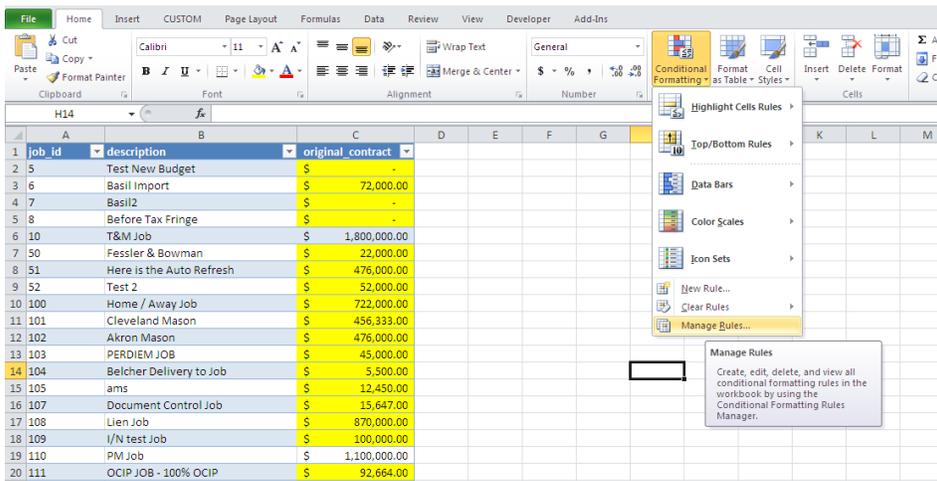
The Conditional formatting should show the Cell Value = 0 FIRST, then Cell Value < 1,000,00 as a second criteria.

Conditional Formatting Rules Manager

Show formatting rules for: Current Selection

New Rule...   Edit Rule...   X Delete Rule   ▲

Rule (applied in order shown)	Format	Applies to		Stop If True
Cell Value < 1000000	AaBbCcYyZz	=$C:$C		☐
Cell Value = 0	AaBbCcYyZz	=$C:$C		☐

OK   Close   Apply

Highlight the rule and click the UP arrow in the toolbar to rearrange the rules.

Conditional Formatting Rules Manager

Show formatting rules for: Current Selection

New Rule...   Edit Rule...   X Delete Rule   ▲   ▼

Rule (applied in order shown)	Format	Applies to		Stop If True
Cell Value = 0	AaBbCcYyZz	=$C:$C		☐
Cell Value < 1000000	AaBbCcYyZz	=$C:$C		☐

OK   Cancel   Apply

With the hierarchy properly defined properly, we now have both rules in effect.

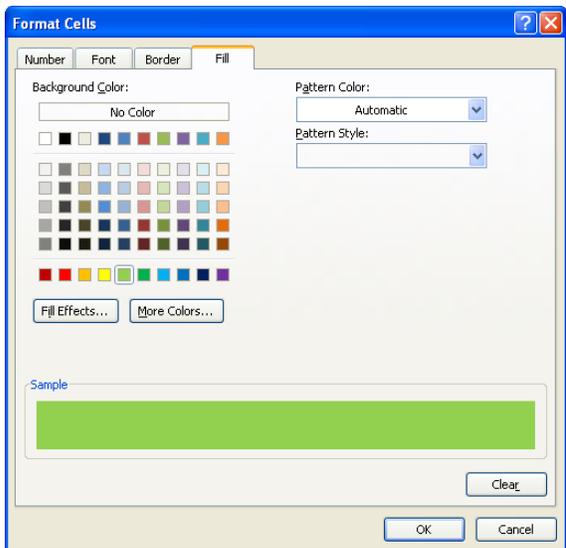|	A	B	C	D	E	F	G
1	job_id	description	original_contract				
2	5	Test New Budget	$ -				
3	6	Basil Import	$ 72,000.00				
4	7	Basil2	$ -				
5	8	Before Tax Fringe	$ -				
6	10	T&M Job	$ 1,800,000.00				
7	50	Fessler & Bowman	$ 22,000.00				
8	51	Here is the Auto Refresh	$ 476,000.00				
9	52	Test 2	$ 52,000.00				
10	100	Home / Away Job	$ 722,000.00				
11	101	Cleveland Mason	$ 456,333.00				
12	102	Akron Mason	$ 476,000.00				
13	103	PERDIEM JOB	$ 45,000.00				

Our third rule will allow us to define the formatting for all values over $1,000,000.

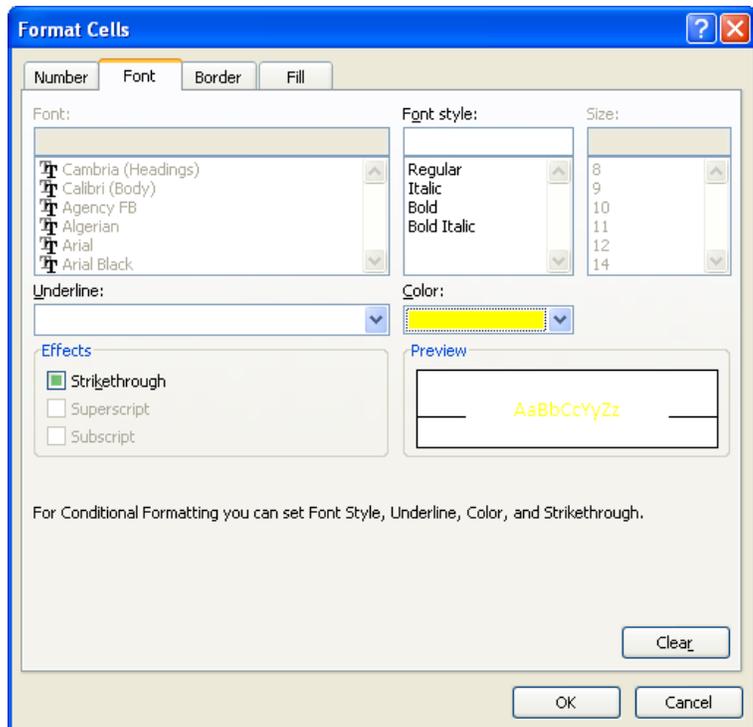Again, highlight all of the data in the desired column and select conditional formatting – new rule.
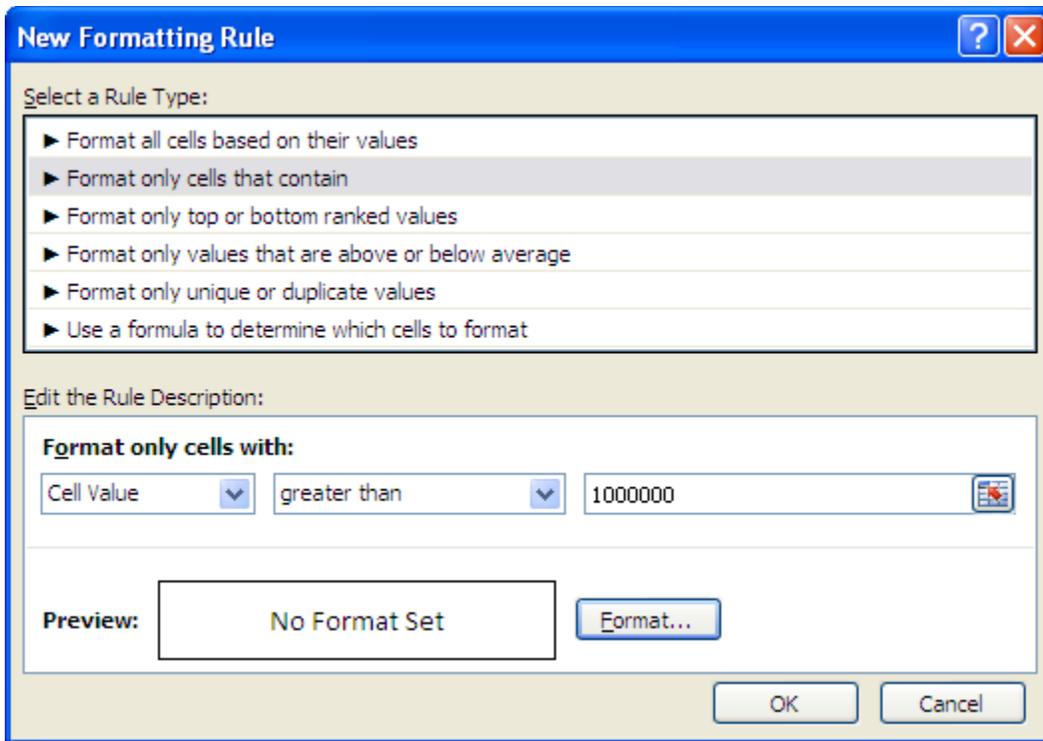
Formatting as follows:

Fill the Cell GREEN   Color the text YELLOW

Here are the results based on our rules:

You may now use the Auto filter options to filter values based on their cell properties :

Formatting for the Top or Bottom Ranked Values :

There are a number of predefined rules that you may use when searching for data.

The TOP/BOTTOM rules are a good way to specify your top $ Contracts.

Select conditional formatting – Top/Bottom Rules – Top 10 Items

If you select a default from the dropdown, you will be able to select predefined formats from a list.