Introduction

Excel allows you to check that the correct sort of data is being entered into a particular cell. For example, you can restrict entry to numbers, a date or values from a list.

Setting a Validation Rule on a Cell

Start with a simple example which restricts entry to a cell to whole numbers:

1. In cell A1 on a new worksheet type **Age** then press `<right_arrow>` to move to cell B1
2. Move to the DATA tab and click on [Data Validation] - a Data Validation window will appear:

   ![Data Validation Window](image)

   - **Settings**
   - **Input Message**
   - **Error Alert**

   **Validation criteria**
   - **Allow:** Any value
   - **Data:** Between
   - **Ignore blank**

   Click **OK**
3. Under Validation criteria on the Settings tab click on the list arrow attached to Allow:
4. Select the option Whole number from the list provided
5. Further settings appear: type in a Minimum: of 0 (press <Tab>) and a Maximum: of 100 - press <Enter> or click on [OK]

Note: You have to set up maximum/minimum values - Excel doesn't allow you to leave these blank. These need not be fixed values, as here, but could be references to other cells (preceded by equals - ie =C1).
6. Now put some data into cell B1 - try typing text, a negative number, a number over 100 or a number with decimal point

The following warning appears:

7. To cancel the warning, press <Enter> or click on [Retry] and try again
8. End by typing a whole number between 0 and 100 - the data is accepted

Note: Validation checks are not carried out if a Data Form is being used.

Customising the Warning Message

The warning message isn't very helpful as it stands. It tells you there is a restriction but doesn't tell you what you need to type. You can customise the message as follows:
1. Move back to cell B1
2. On the DATA tab, click on [Data Validation] again
3. Click on the Error Alert tab to see the following:

4. Using the list arrow attached to Style: change the sign to Warning
Note that Excel provides three levels of warning: Stop forces the user to retry until valid data is entered; Warning allows the user to enter invalid data if they insist; Information readily accepts invalid data.

5. Under the heading Title: type the message Please Note: - press <Tab>
6. In the Error message: box type: Only whole numbers between 0 and 100 should be entered into this cell
7. Click on [OK]
8. Now type an invalid number (or text) into cell B1 to see the improved message
9. Press <Enter> or click on [No]
10. Repeat steps 8 and 9 but this time click on [Yes] - the invalid data is accepted

Setting Warning Messages before Data Entry

It can be annoying to be given messages after you have typed in some data; it’s often much better to warn users beforehand:

1. Move back to cell B1
2. On the DATA tab, click on [Data Validation] again
3. Click on the Input Message tab to see the following:

4. The Show input message when cell is selected check box should already be ticked on
5. Under the heading Title: type the message Your Age: - press <Tab>
6. In the Input Message: box type: Enter your age to the nearest whole number
7. Click on [OK]

You will see the new message displayed. This only appears when the cell is the active cell.

8. Move to a cell other than B1 - the message disappears
9. Move back to cell B1 - it appears again
10. Enter your age, as specified
Copying a Validation to Another Cell

If you want to set up a validation on a block of cells, select them before you create the validation. You can also copy a validation from one cell to the others:

1. Move to cell B1 (if you're not already there) then right click and choose Copy
2. Now select the cells to which you want to apply the validation - here, B2 to B5
3. Right click again and choose Paste Special... (click on the words – there isn't an icon)
4. Under the Paste heading click on Validation then press <Enter> or click on [OK]

This will copy just the validation to the cells. Make sure you don't now press <Enter> or you will paste ALL the cell properties, including the data.

5. If you want to stop the active copy, press <Esc>
6. Move down column B typing data into the four cells with validation set - each time the help message appears and, if you enter invalid data, the error message activates

Note: If you use normal (relative) cell references in a validation, these will change to reflect their new positions if copied/pasted. To prevent this, absolute references (eg $B$1) must be used.

Non-Numeric Validations

So far you have only looked at numeric, indeed whole number, validation. You can similarly check for numbers with decimal points. Other possibilities are dates/times and text up to a certain number of characters. Another option allows data entry from a fixed list of values (numeric or non-numeric).

First, try out a date:

1. Move to cell A6 and type the word Birthday - press <right_arrow>
2. In cell B6, click on [Data Validation] on the DATA tab
3. On the Settings tab, under Validation criteria, change Allow: to Date
4. For the Start date: type 1 Jan (you must set a value) then press <Tab>
5. For the End date: type 31 Dec
6. Press <Enter> or click on [OK]

Note: Though you didn’t enter a year into the Start date and End date (and none is displayed in the cell), Excel needs one and has chosen the current year. If you try to enter your date of birth into cell B6, the standard error message appears. You would need to include years at steps 4 and 5 above to correct this.

Next, try setting up a list:

8. Move to cell A7 and type Gender - press <right_arrow>
9. In cell B7, click on [Data Validation] on the DATA tab again
10. On the Settings tab, under Validation criteria, change Allow: to List
11. In the Source box type the list values, separating each with a comma - ie Male, Female

Note: When you set up the validation, the Ignore blank check box was switched on. This allows for a blank entry - turn this option off if a value must be chosen from the list.

12. Press <Enter> or click on [OK] - an arrow is added to the cell
13. Use the list arrow to select a Gender from the list

Finally, try setting up a limited text field:

14. Move to cell A8 and type Username - press <right_arrow>
15. In cell B8, click on [Data Validation] on the DATA tab again
16. On the Settings tab, under Validation criteria, change Allow: to Text length
17. Using the list arrow provided, change Data: to less than or equal to - press <Tab>
18. Set a Maximum: value of 8
19. Press <Enter> or click on [OK]
20. Try typing more than 8 characters in the cell and press <Enter> - the error message appears
21. Press <Enter> or click on [Retry] then type in your actual logon username and press <Enter> - this time the data is accepted

Note: As an alternative to the above you could have kept the Data setting as between and then set both Minimum (1) and Maximum (8) values.

Lists and Sub-Lists

In the previous exercise you used a list to set up a validation. The value selected from one list can be used to set the values available in a supplementary list: via the Indirect function:

1. Move to cell K1 and type Men - press <right_arrow>
2. In cell L1 type Women - press <Enter>
3. In cells L2 to L6 type five girls' names - eg Alice, Liz, Mary, Sarah and Vicky
4. Move to cell K2 then in cells K2 to K5 type four boys' names - eg Alex, Fred, Paul and Simon

Next, you need to name the cell ranges:

5. Drag through cells K2 to K5 then click in the Name Box (above column A), type Men - press <Enter>
6. Repeat step 5 but this time select cells L2 to L6 and call them Women - press <Enter>

Now set up the validations:

7. Move to cell H1 and click on [Data Validation] on the DATA tab
8. On the Settings tab, under Validation criteria, change Allow: to List
9. Click in the Source box then drag though cells K1 to L1 (you can pick up list values from cells)
10. Press <Enter> for [OK]
11. Test the list is working by selecting a value for cell H1 then press <Enter> to move to cell H2

Note: If you don’t set up a value here then you get an error message when trying to set up the second list..

12. In cell H2, repeat steps 7 and 8
13. Click in the Source box then type =Indirect(H1) - press <Enter> for [OK]

You probably won’t have met the Indirect function, but it uses the value shown in cell H1 to define the named range for this cell. Now see whether it has worked:

14. Test the list is working by selecting a value for cell H2 – you should find you have a list of either Men or Women, depending on the value shown in H1
15. Move back to H1 and select the alternative value
16. Check that you now have the other list of values in H2

Obviously, the data has to be chosen in the correct order – the user has to set a value in cell H1 first – but that would usually be what would happen (eg if the user was filling out a questionnaire). You would also probably hide the named ranges. Once the validation has been set up, the values can be cleared:

17. Drag through H1 and H2 and <Delete> the current values (leaving just the validation intact)
18. Drag across the column K and L headings then right click and EITHER change the [Font color] to white OR Hide them – you could, of course, have the values stored on a different (hidden) sheet
Customised Validations

Sometimes you may want a validation which is not covered by the existing options. All validations test whether something is TRUE or FALSE and Excel allows you to set up your own tests. In this next example, a set of expenses must be within a particular budget:

1. Move to cell A10 and type Budget - press <right_arrow>
2. In cell B10 enter the expenditure limit of 20 - press <Enter>
3. Select cells B10 to B14 and apply a currency style (right click, choose Format Cells..., set the Category to Accounting and click [OK])
4. In cells A11 to A14 type the headings Food, Drink, Tip and Total
5. Move to cell B14 and type the formula =SUM(B11:B13) and press <Enter>

Though cell B14 shows the total cost, validation can't be set here because checks are made on data entry, not on calculated values. Instead, validation must be set on the cells used in the calculation:

6. Select cells B11 to B13 by dragging through them
7. Click on [Data Validation] on the DATA tab,
8. On the Settings tab, under Validation criteria, change Allow: to Custom
9. In the new Formula: box type: = $B$14<=$B$10 (you must use absolute references)

Tip: To create an absolute reference, type in the cell reference as normal then press <F4> once.
10. On the Error Alert tab, type an Error message: stating that Expenditure must be within the budget then click on [OK]
11. Now try entering data into cells B11 to B13 - if the total exceeds £20 the message will appear

Sometimes, use has to be made of the OR or AND function. These offer alternative/joint tests respectively. For example, you might want to restrict the level of tipping in your budget:

12. Select cells B11 to B13
13. Click on [Data Validation] again on the DATA tab
14. On the Error Alert tab, change the Error message: to Expenditure must be within the budget and tips no higher than 20% of the total cost
15. On the Settings tab, change the Formula: to =AND($B$14<=$B$10, $B$13<=$B$14*20%) then press <Enter> or click on [OK]
16. Now try entering data into cell B13 - if the tips exceed 20% of the total or the total is over £20 the warning message will appear

Editing Validations

If you want to change a validation, Excel lets you update it in all cells using the same validation across the worksheet. Here, for example, you might want to reduce the tip to 15% of the total:

1. Move to any of the cells with the validation to be updated - eg B12
2. Click on [Data Validation] on the DATA tab
3. On the Settings tab, click on the symbol on the right of the Formula: box to display the formula
4. Change 20% to 15% and press <Enter>
5. Turn ON Apply these changes to all other cells with the same settings by clicking in the check box at the foot of the window
6. Move to the Error Alert tab and edit the Error Message to reflect the new value
7. Click on [OK] to set the new validation - try it out, if you like
Identifying Cells with Validations

In the above example you applied the new validation to all cells with the same settings. Before you do this it's usually a good idea to check which cells will be affected. Excel can show you all the cells which have a validation or just those with the same setting.

1. Move to the HOME tab then click on the [Find & Select] button on the far right and select Data Validation – the cells with validation settings are shown with shading
2. Click on cell B12 then click on [Find & Select] again but this time select Go To Special...
3. Turn on Data validation at the end of the Select list and change the current setting from All to Same
4. Press <Enter> or click on [OK] to see the cells whose validation matches the settings for B12

Tracing Cells which Violate Validations

One final use of cell validation is to check for data values which violate certain conditions. This can be invaluable when, for example, you want to check a large data set for typing errors - you simply select the data, set up a validation then trace the errors. To show how this is done:

1. Move to cell B10 and set a budget lower than the current total in B14
2. Move to cell B1 and type 101 (<Enter>) - click on [Yes] to override the validation

The worksheet doesn't show any problems because the validation is only carried out on data entry. However, you can force a validation check on all cells as follows:

3. Move to the DATA tab and this time click on the arrow attached below [Data Validation]
4. Choose Circle Invalid Data - the cells with invalid values are now circled in red.

To turn off the circles:
5. Repeat steps 3 and 4 but choose Clear Validation Circles
6. Close the workbook - there's no need to save it