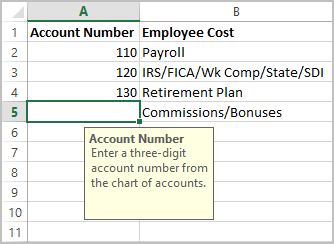
Use data validation to control the type of data or the values that users enter into a cell.

**Examples**: Use data validation to:

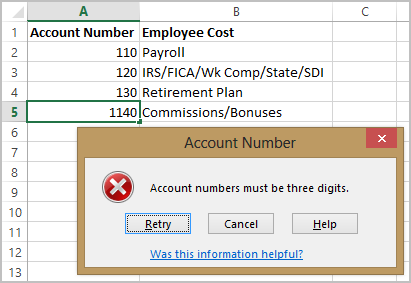
* Restrict data entry to a certain range of dates
* Limit choices by using a list
* Make sure that only positive whole numbers are entered.

Messages can also be provided to users to define the input expected for the cell and instructions to help users correct any errors.

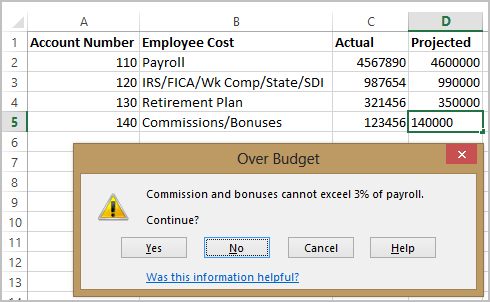
For example, a cell is set up to allow only account numbers that are exactly three characters long. When users select the cell, a message will display informing them.



If users ignore this message and type invalid data in the cell, such as a two-digit or five-digit number, an error message will display.



In a slightly more advanced scenario, data validation might be used to calculate the maximum allowed value in a cell based on a value elsewhere in the workbook. In the following example, the user has typed $140,000 in cell D5, which exceeds the maximum limit specified for commissions and bonuses.

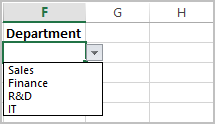


If the payroll budget were to increase or decrease, the allowed maximum in D5 would automatically increase or decrease with it.

**When is Data Validation Useful?**

Data validation is invaluable when sharing a workbook with others in the organization, and the data entered must be accurate and consistent. Among other things, data validation can:

* **Restrict data to predefined items in a list**    For example, the types of departments can be limited to Sales, Finance, R&D, and IT. Create the list of values in a range of cells elsewhere in the worksheet.



* **Restrict numbers outside a specified range**

*Example*: Specify a minimum limit of deductions to two times the number of children in a particular cell.

* **Restrict dates outside a certain time frame**

*Example*: Specify a time frame between today's date and 20 days from today's date.

* **Restrict times outside a certain time frame**

*Example*: Specify a time frame for serving breakfast between the time when the restaurant opens and 5 hours after the restaurant opens.

* **Limit the number of text characters**

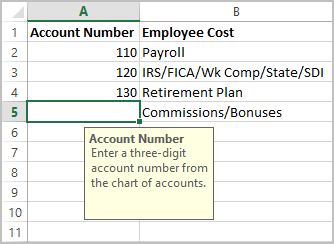
*Example*: Limit the allowed text in a cell to 10 or fewer characters. Similarly, set the specific length for a full name field (C1) to be the current length of a first name field (A1) and a last name field (B1), plus 10 characters.

* **Validate data based on formulas or values in other cells**

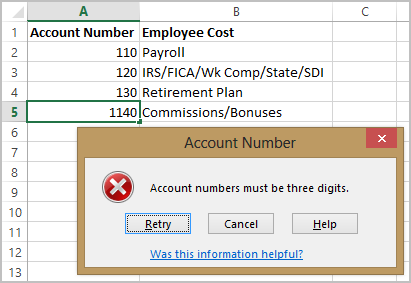
*Example*: Use data validation to set a maximum limit for commissions and bonuses of $3,600, based on the overall projected payroll value. If users enter more than $3,600 in the cell, they see a validation message.

**Data Validation Messages**

What users see when they enter invalid data into a cell depends on how the data validation has been configured. One option is to show an **Input Message** when the user selects the cell. Input messages are generally used to offer users guidance about the type of data that should be entered in the cell. This type of message appears near the cell. The message can be moved, but will remain until the user moves to another cell or presses Esc.



Another option is to show an **Error Alert** that appears only after users enter invalid data.



Choose from three types of error alerts:

|  |  |  |
| --- | --- | --- |
| **Icon** | **Type** | **Use to** |
| Stop icon | Stop | Prevent users from entering invalid data in a cell. A **Stop** alert message has two options: **Retry** or **Cancel**. |
| Warning icon | Warning | Warn users that the data they entered is invalid, without preventing them from entering it. When a **Warning** alert message appears, users can click **Yes** to accept the invalid entry, **No** to edit the invalid entry, or **Cancel** to remove the invalid entry. |
| Information icon | Information | Inform users that the data they entered is invalid, without preventing them from entering it. This type of error alert is the most flexible. When an **Information** alert message appears, users can click **OK** to accept the invalid value or **Cancel** to reject it. |

The text that users see in an error alert message can be customized. When no error alert message is created, users see a default message. Input messages and error alerts appear only when a cell is selected or data is typed directly into the cell. They do not appear under the following conditions:

* A user enters data in the cell by copying or filling
* A formula in the cell calculates a result that is not valid
* A macro enters invalid data in the cell

**Tips for Working with Data Validation**

Use these tips and tricks for working with data validation in Excel.

* If the worksheet or workbook will be protected, protect it after specifying any validation settings. Make sure to unlock any validated cells before the worksheet is protected. Otherwise, users will not be able to type any data in the cells.
* If the workbook will be shared, share it only after specifying data validation and protection settings. After a workbook is shared, changes cannot be made to the validation settings unless sharing is stopped. However, Excel will continue to validate designated cells while the workbook is being shared.
* Data validation can be applied to cells that already have data entered in them. However, Excel does not automatically display a notification that existing cells contain invalid data. In this scenario, highlight invalid data by instructing Excel to circle it on the worksheet. Once invalid data is identified, hide the circles again. If an invalid entry is corrected, the circle disappears automatically.
* To quickly remove data validation for a cell, select it, and then open the **Data Validation** dialog box (**Data** tab, **Data Tools** group). On the **Settings** tab, click **Clear All**.
* To find the cells on the worksheet that have data validation, on the **Home** tab, in the **Editing** group, click **Find & Select**, and then click **Data Validation**.
* When creating a drop-down list, use the **Define Name** command (**Formulas** tab, **Defined Names** group) to define a name for the range that contains the list. After the list is created on another worksheet, hide the worksheet that contains the list and then protect the workbook so that users won't have access to the list.

**If Data Validation isn't Working, Make Sure That:**

* **Users are not copying or filling data**

Data validation is designed to show messages and prevent invalid entries only when users type data directly in a cell. When data is copied or filled, the messages do not appear. To prevent users from copying and filling data by dragging and dropping cells, clear the **Enable fill handle and cell drag-and-drop** check box in the **Advanced** category of the **Excel Options** dialog box (**File** tab, **Options** command), and then protect the worksheet.

* **Manual recalculation is turned off**

If manual recalculation is turned on, uncalculated cells can prevent data from being validated correctly. To turn off manual recalculation, on the **Formulas** tab, in the **Calculation** group, click **Calculation Options**, and then click **Automatic**.

* **Formulas are error free**

Make sure that formulas in validated cells do not cause errors, such as #REF! or #DIV/0!. Excel ignores the data validation until the error is corrected.

* **Cells referenced in formulas are correct**

If a referenced cell changes so that a formula in a validated cell calculates an invalid result, the validation message for the cell won't appear.

**Add Data Validation to a Cell or Range**

1. Select one or more cells to validate.
2. On the **Data** tab, in the **Data Tools** group, click **Data Validation**.
3. If it isn't already selected, in the **Data Validation** dialog box, click the **Settings** tab.
4. Select the type of validation in the **Allow** drop-down list.

**NOTE**: For a **List**, the width of the drop-down list is determined by the width of the cell that has the data validation. The width of that cell might need to be adjusted to prevent truncating the width of valid entries that are wider than the width of the drop-down list.

**NOTE:** If allowed values are based on a cell range that has a defined name and there is a blank cell anywhere in that range, selecting the **Ignore blank** check box allows any value to be entered in the validated cell. This is also true for any cells that are referenced by validation formulas: if any referenced cell is blank, selecting the **Ignore blank** check box allows any value to be entered in the validated cell.

**The Data Validation Command is Unavailable.**

* **An Excel table might be linked to a SharePoint site**

Data validation cannot be added to an Excel table that is linked to a SharePoint site. To add data validation, unlink the Excel table or convert the Excel table to a range.

* **Data is being entered**

The **Data Validation** command is not available on the **Data** tab while data is being entered in a cell. To finish entering data, press **Enter** or **Esc**.

* **The worksheet might be protected or shared**

Data validation settings cannot be changed if the workbook is shared or protected.

**Display an Optional Input Message**

1. Click the **Input Message** tab (**Data** tab > **Data Tools** > **Data Validation**).
2. Make sure the **Show input message when cell is selected** check box is selected.
3. Fill in the title and text for the message.

**Specify an Optional Alert or Error Message when Invalid Data is Entered.**

1. Click the **Error Alert** tab (**Data** tab > **Data Tools** > **Data Validation**), and make sure that the **Show error alert after invalid data is entered** check-box is selected. To allow users to type entries that are not in the list, clear the **Show error alert after invalid data is entered** check-box instead.
2. Select one of the options in the **Style** drop-down box.
3. Fill in the title and text for the message (up to 225 characters). If left blank, Excel will display a generic **alert message.**

**Adding Other Types of Data Validation**

The following table lists other types of data validation and shows ways to add them to worksheets.

| **To Do This:** | **Follow These Steps:** |
| --- | --- |
| Restrict data entry to whole numbers within limits | 1. Follow steps 1-3 in the **Add Data Validation to a Cell or Range** on the previous page. 2. From the **Allow** drop-down list, select **Whole number**. 3. In the **Data** box, select the type of restriction wanted. For example, to set upper and lower limits, select **between**. 4. Enter the minimum, maximum, specific value to allow, or a formula that returns a number value.   *Example*: If validating data in cell F1 by setting a minimum limit of deductions to two times the number of children in that cell, select **greater than or equal to** in the **Data** box and enter the formula, **=2\*F1**, in the **Minimum** box. |
| Restrict data entry to a decimal number within limits | 1. Follow steps 1-3 in the **Add Data Validation to a Cell or Range** on the previous page. 2. From the **Allow** drop-down list, select **Decimal**. 3. In the **Data** box, select the type of restriction wanted. For example, to set upper and lower limits, select **between**. 4. Enter the minimum, maximum, specific value to allow, or a formula that returns a number value.   *Example*: A maximum limit for commissions and bonuses of 6% of a salesperson's salary in cell E1, select **less than or equal to** in the **Data** box and enter the formula, **=E1\*6%**, in the **Maximum** box.  **NOTE**: To let a user enter percentages, for example 20%, select **Decimal** in the **Allow** box. Next, select the type of restriction wanted in the **Data** box. Enter the minimum, maximum, or specific value as a decimal, for example **.2**, and then display the data validation cell as a percentage by selecting the cell and clicking **Percent Style** in the **Number** group on the **Home** tab. |
| Restrict data entry to a date within a time frame. | 1. Follow steps 1-3 in the **Add Data Validation to a Cell or Range** on the previous page. 2. From the **Allow** drop-down list, select **Date**. 3. In the **Data** box, select the type of restriction wanted. For example, to allow dates after a certain day, select **greater than**. 4. Enter the start, end, or specific date to allow, or enter a formula that returns a date.   *Example*: To set a time frame between today’s date and 20 days from today’s date, select **between** in the **Data** box, enter **=TODAY()** in the **Start date** box, and enter **=TODAY()+20** in the **End date** box. |
| Restrict data entry to a time within a time frame. | 1. Follow steps 1-3 in the **Add Data Validation to a Cell or Range** on page 5. 2. From the **Allow** drop-down list, select **Time**. 3. In the **Data** box, select the type of restriction wanted. For example, to allow times before a certain time of day, select **less than**. 4. Enter the start, end, or specific time to allow. To enter specific times, use the hh:mm time format.   *Example*: There is a time value for breakfast service entered in cell G1, and time entries need to be restricted to the period starting when the dining hall opens (the value in cell G1) and five hours after that, select **between** in the **Data** box, enter **=G1** in the **Start time** box, and then enter **=G1+”5.00”** in the **End time** box. |
| Restrict data entry to text of a specified length. | 1. Follow steps 1-3 in the **Add Data Validation to a Cell or Range** on page 5. 2. From the **Allow** drop-down list, select **Text length**. 3. In the **Data** box, select the type of restriction wanted. For example, to allow a certain number of characters, select **less than or equal to**. 4. Enter the minimum, maximum, specific length for the text, or a formula that returns a number value.   *Example*: To set the specific length for a full name field (C1) to be the current length of a first name field (A1) and a last name field (B1) plus 10, select **less than or equal to** in the **Data** box and enter **=SUM(LEN(A1),LEN(B1),10)** in the **Maximum** box. |
| Calculate what is allowed based on the content of another cell. | 1. Follow steps 1-3 in the **Add Data Validation to a Cell or Range** on page 5. 2. From the **Allow** drop-down list, select the type of data. 3. In the **Data** box, select the type of restriction wanted. 4. In the box or boxes below the **Data** box, click the cell wanted to specify what is allowed.   *Example*: To allow entries for an account only if the result won't go over the budget in cell E4, select **Decimal** for **Allow**, select **less than or equal to** for **Data**, and in the **Maximum** box, enter **=E4**. |
| Use a formula to calculate what is allowed. | 1. Follow steps 1-3 in the **Add Data Validation to a Cell or Range** on page 5. 2. In the **Allow** box, select **Custom**. 3. In the **Formula** box, enter a formula that calculates a logical value (TRUE for valid or FALSE for invalid entries). The following table provides examples. |

**Examples of Formulas in Data Validation**

| **To make sure that** |  | **Enter this formula** |
| --- | --- | --- |
| The cell for the picnic account (B1) can only be updated if nothing is budgeted for the discretionary account (D1) and the total budget (D2) is less than the $40,000 allocated. |  | **=AND(D1=0,D2<40000)** |
| The cell that contains a product description (B2) only contains text. |  | **=ISTEXT(B2)** |
| For the cell that contains a projected advertising budget (B3), the subtotal for subcontractors and services (E1) must be less than or equal to $800, and the total budget amount (E2) must also be less than or equal to $97,000. |  | **=AND(E1<=800,E2<=97000)** |
| The cell that contains an employee age (B4) is always greater than the number of full years of employment (F1) plus 18 (the minimum age of employment). |  | **=IF(B4>F1+18,TRUE,FALSE)** |
| All the data in the cell range A1:A20 contains unique values. |  | **=COUNTIF($A$1:$A$20,A1)=1**  The formula must be entered in data validation for cell A1, and then fill the cells A2 though A20 so that the data validation for each cell in the range has a similar formula, but the second argument to the **COUNTIF** will match the current cell. |
| The cell that contains a product code name (B5) always begins with the standard prefix of ID- and is at least 10 characters long. |  | **=AND(LEFT(B5, 3) ="ID-",LEN(B5) > 9)** |