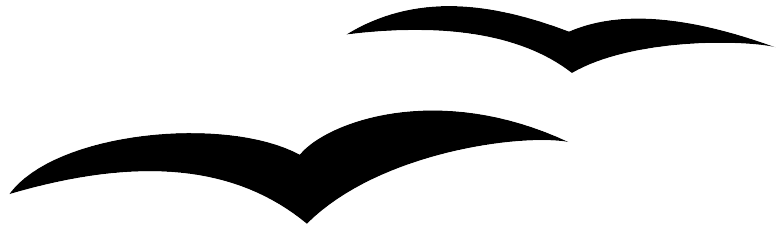


Combining Multiple Objects:



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Version: 1.0
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Overview

This document describes the tools and functions that let you combine several objects together so that changes can be carried out to the group, or new objects can be created from the group.

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Feedback

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Modifications and updates

<i>Version</i>	<i>Date</i>	<i>Description of Change</i>
1.0	20 November 2004	First published edition

Grouping and Combining Objects

Draw contains a number of mechanisms that let you combine several objects together so that changes can be carried out to the group, or new objects can be created from the group

Grouping lets you temporarily combine objects to carry out global changes to them. A group can always be undone and the objects that make up the group can always be manipulated separately.

A *combination* is a permanent fusion of objects leading to a new object. The initial objects are no longer available as individual entities and the operation is therefore irreversible (unless you use the Edit/Undo function which is dependent on the number of undo steps set under Options).

Whatever you decide to do, several objects need to be selected for these functions to work. Just a quick reminder on how to select multiple objects: click on each object while holding down the Shift key or draw a rectangle around the objects that you wish to include in the selection.

Grouping Functions

Group by common selection

When several objects are selected, any operations you carry out are applied to all of the objects. For example, you can rotate a group of objects in its entirety. Groups obtained through common selection of several objects are undone as soon as you click outside the group. However, there is also a way to group objects and keep those selected objects grouped together.

Maintaining groups and group dissociation

To group selected objects, you can right-click and choose **Group** from the context menu. You can also use the keyboard shortcut *Control + Shift + G*. It is also possible to go via the main menu **Modify > Group**.

When objects are grouped, all of the editing operations carried out on that group are applied to all members of the group. If you click on one of the members of the group, the whole of the group will be selected. This method is thus safer than direct selection, which is best left to simple drawings.

As indicated at the beginning of the chapter, the objects of a group maintain their individuality and it is possible to undo a group via the context menu (**Ungroup**) or using the keyboard shortcut *Alt + Control + Shift + G* or even the main menu **Modify > Ungroup**.

Editing individual objects in a group

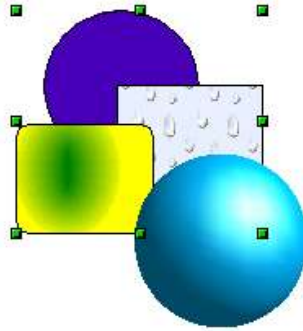
The objects in a group keep all of their properties, and it is always possible to edit each object individually without breaking the group. To do this, you need to use the function **Enter group** that is available through the right-click menu or the *F3* key. You can also enter a group by double-clicking on it, and then click on the desired individual object.

Once you have entered this mode, you can click on and edit each object separately.

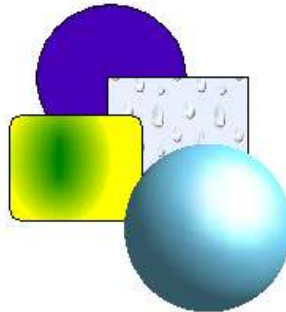
To leave this mode, use the function Exit group or keyboard shortcut *Control + F3*. You can also double-click anywhere outside of the group.

When you work inside a group, the objects that are not within the group can no longer be selected and appear grayed out.

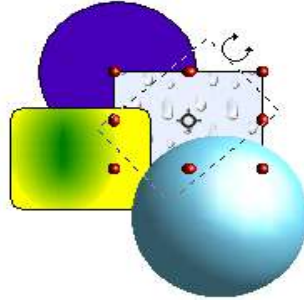
Here's an example of the use of this function.



The 2D shapes above form part of a group. The 3D sphere is not part of the group. When the group is selected (as above) and you press the F3 key, you get the following:



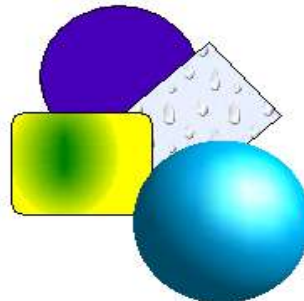
The sphere moves out of focus to indicate that it isn't part of the group and that you can't select it. In this mode, you can select any one of the objects in the group and edit it individually.



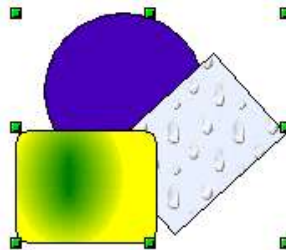
In the example given, we are going to rotate the straight rectangle. After you rotate the rectangle, you can press *Control + F3* to leave the group, and the sphere will become available for selection once again.

Notice that you can create nested groups, or groups of groups. In this case, OpenOffice.org keeps the initial group hierarchy. If you ungroup a group made of other groups, you will be left with individual groups that you can then ungroup further.

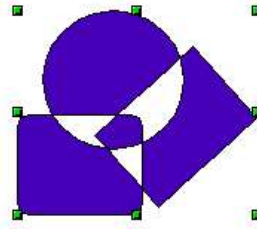
Combination Functions



In contrast to grouping functions, combinations create a new object. To use this function: choose all of the objects that you want to combine, then right-click and choose the option **Combine** from the context menu. The keyboard shortcut is *Control + Shift + K*.

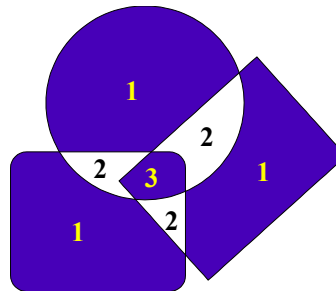


The result of the combination is given in the following illustration:



At first glance, this can seem rather surprising. Fortunately, once you have understood the rules governing combination in OpenOffice.org, it will become clear:

- The attribute of the resulting object is the attribute of the object that is the furthest back from the viewer. In our example, it is the circle. The resulting drawing has the same color, line thickness, etc., as the circle.
- The result of the combination is a Bezier curve.
- Where the objects overlap, the overlapping zones will be represented as a filled or empty zone depending on the number of overlaps. When there is an even number of overlaps, you get an empty space (represented by a 'hole') in the drawing. When the overlaps are odd in number, you get a filled area. In our example, we can count the number of superpositions:

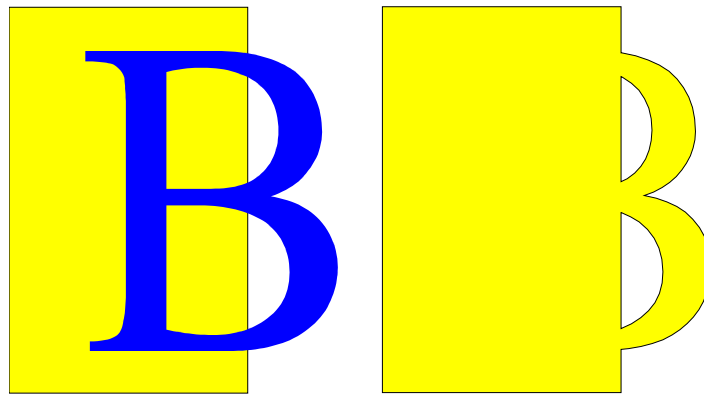


Shape Merge Functions

The functions Merge, Subtract, and Intersect, can be reached through the group's context menu, under the heading Shapes.

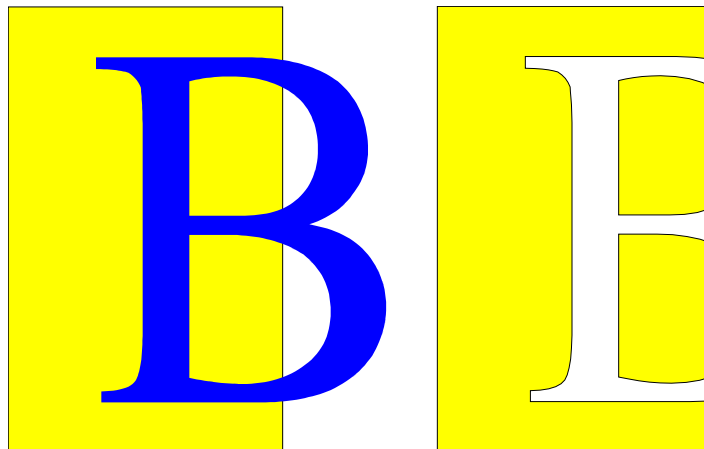
Merge

The result of applying the Merge function to the shapes corresponds to the greatest surfaces of the selected objects being merged into one object (also known as a union).



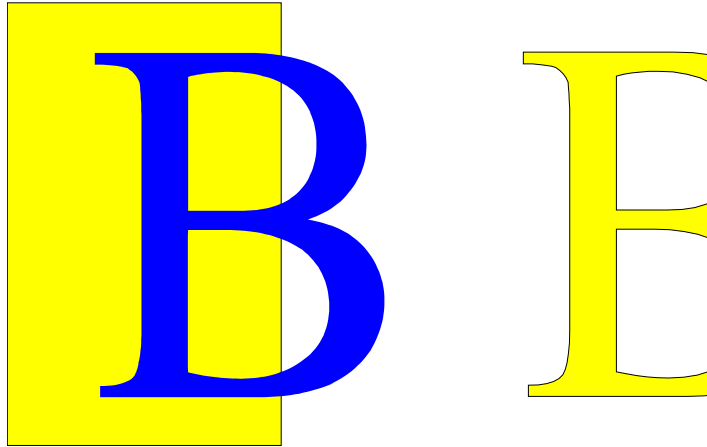
Subtract

Subtraction will take away from the lowermost layered object the area corresponding to the overlap from the uppermost object, and the uppermost object will disappear:



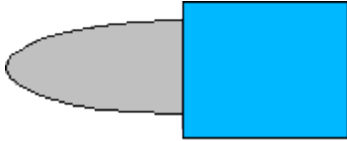
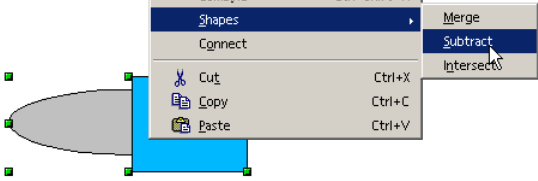
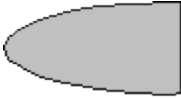







Intersect

Intersecting two objects leads to an object that just represents the area of overlap between the two selected objects.





Putting the Shape Merge Functions to use

The following example illustrates how complex shapes can be created by using the Shape Merge functions.

	<p>Draw an ellipse and then a rectangle overlapping half of its width.</p>
	<p>Select both shapes and pick Shapes, <i>subtract</i> from the context menu.</p>
	<p>This is the shape that results.</p>
	<p>Draw another rectangle and position over the top half of the ellipse, <i>subtract</i> again.</p>
	<p>The shape is now beginning to resemble a knife blade.</p>
	<p>Draw a small ellipse covering just the lower corner to create a notch in the blade.</p>
	<p>After <i>subtracting</i> again the knife blade is complete.</p>
	<p>To make the handle draw a rectangle and an ellipse as shown.</p>
	<p>This time use the <i>merge</i> function to add the shapes together.</p>
	<p>A touch of 3D adds some depth to our basic knife.</p>

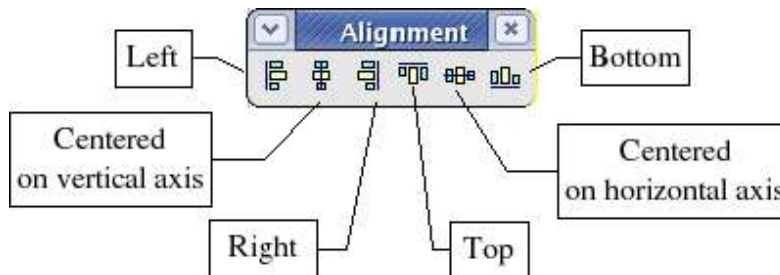
Aids for Object Positioning

The Draw module has various tools that are designed to help in the positioning of objects, in order to change the alignment of objects and the relative “front to back” ordering of objects. These tools can be reached through two icons in the left hand toolbar.

-  This button gives you access to the object alignment toolbar.
-  This button gives you access to the object layering toolbar.

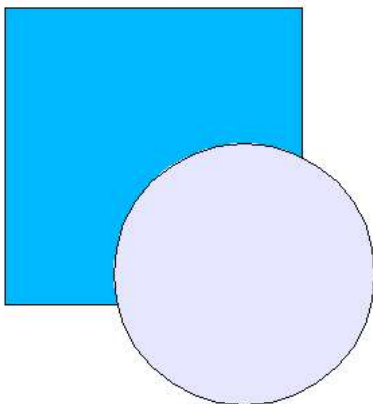
Aligning Objects

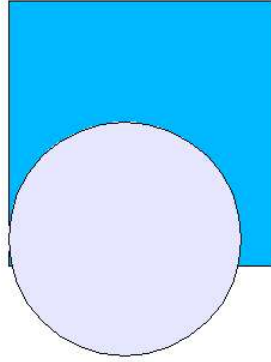
The alignment toolbar has six buttons as shown below:



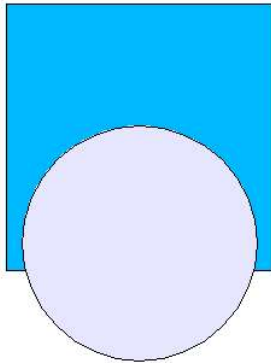
This toolbar can be detached from the main lefthand toolbar and remain visible in the workspace. The buttons become active when objects are selected. The toolbar lets you align any selected objects in a certain way.

To show what can be done, let's start from the following two objects:

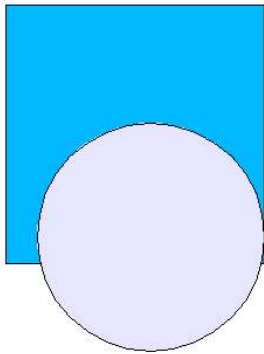




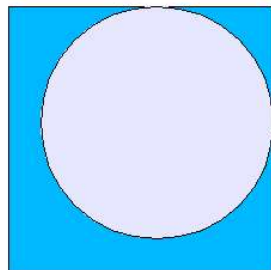
All of the objects are aligned on their left side.



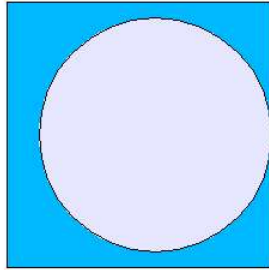
All of the objects are centered vertically.



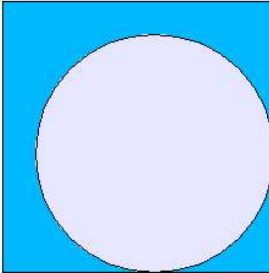
All of the objects are aligned on their right side.



All of the objects are aligned on their upper side.



All of the objects are horizontally centered.



All of the objects are aligned on the lower side.

Distribution of Objects

When several objects are selected, Draw provides ways to let you distribute these objects harmoniously, both vertically and horizontally. To display the object distribution dialog box (Figure 1), right-click and choose **Distribution** from the context menu of the selected objects (you need at least three objects for this option to show up in the menu).

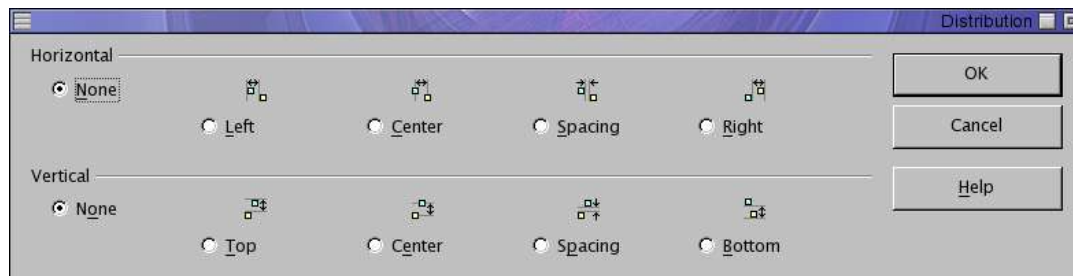


Figure 1 - Object distribution dialog

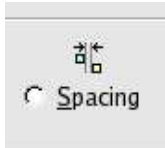
The various options let you choose the distribution of the objects independently along a horizontal and vertical axis. The option **None** additionally enables you to choose to have the objects distributed along one or none of the axes.



The objects are distributed horizontally from their left side.



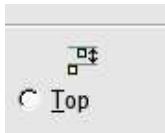
The objects are distributed horizontally from their middle (in reality it is the middle of the selection rectangle around each object).



The objects are distributed by introducing the same horizontal spacing between two objects.



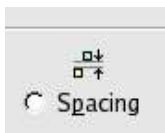
The objects are distributed horizontally from their right side.



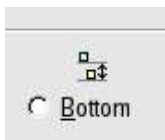
The objects are distributed vertically from their upper side.



The objects are distributed vertically from their middle.



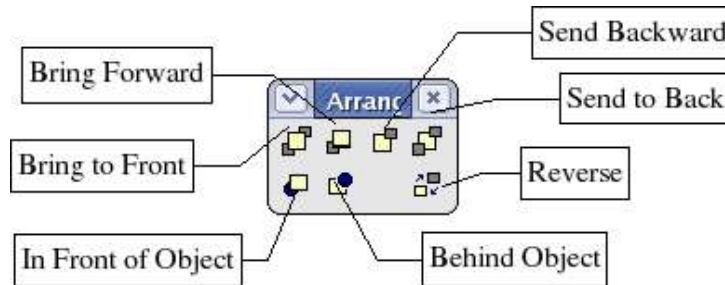
The objects are distributed by introducing the same vertical space between them.



The objects are distributed vertically from their lower side.

Managing Object Arrangement

The toolbar for object arrangement is as shown below. The toolbar lets you manage the relative superposition of objects. This toolbar can be detached.



The examples given below should help you understand the principles behind the idea.

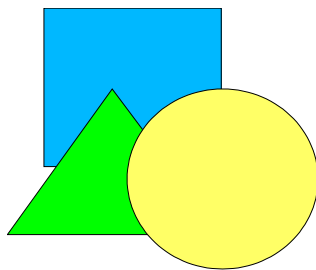


Figure 2. Original group of objects

This is the original group of objects.

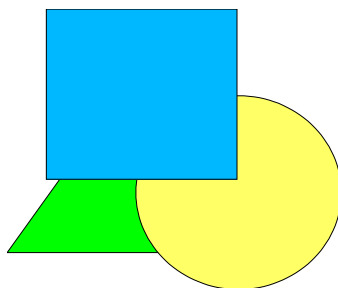


Figure 3 - Bring to Front

The square was selected.

This button brings the selected object to the top of the pile of objects. As shown in the drawing opposite, the square is now on top of the pile.

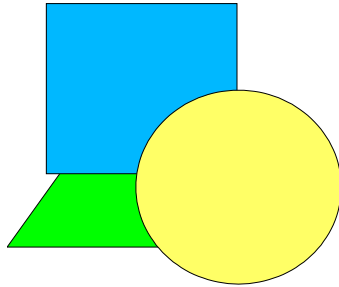


Figure 4 - Bring forward

The square was selected.

This button brings the selected object forward one layer. The square has been moved in front of the triangle, but is still behind the circle.

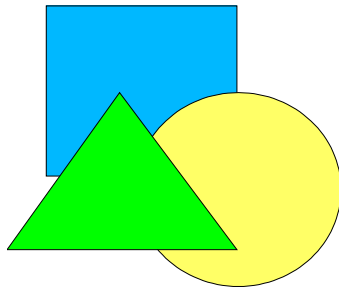


Figure 5 - Send backward

The circle was selected.

This button moves an object back one layer. In the drawing opposite, the circle has been moved behind the triangle, but is still in front of the square.

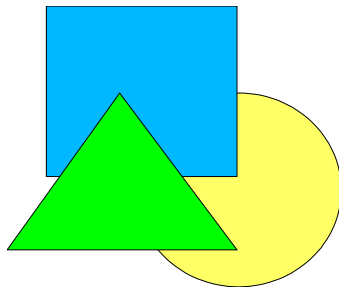


Figure 6 - Send to back

The circle was selected.

This button will send the selected object to the bottom of the pile. This is what happened to the circle in the drawing opposite.

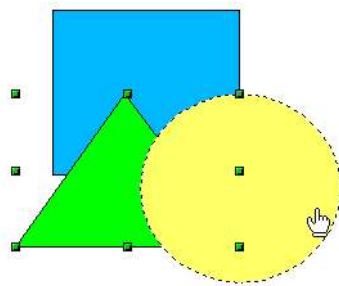


Figure 7 - In front of object

This button moves one object in front of another chosen object.

The object to be moved is selected first (in this case the triangle).

After you click on the button, the mouse cursor turns into a hand to designate the object in front of which the selected object will be placed (in this case the circle).

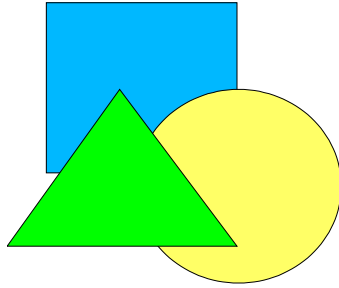


Figure 8 - Result of the 'in front' arrangement

The result of the arrangement is shown on the left.

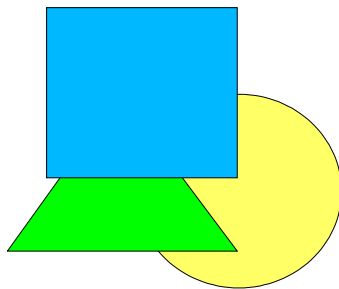


Figure 9 - Invert arrangement

For this button to work, you need to have at least two objects selected. The order of the selected objects is inverted in the pile of objects. In the example opposite, the square and the circle that were selected have had their positions inverted.